**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

February 11, 2016

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

SUBJECT: CALLAWAY PLANT – NRC INTEGRATED INSPECTION REPORT 05000483/2015004

Dear Mr. Diya,

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. On January 11, 2015, the NRC inspectors discussed the results of this inspection with Mr. Tim E. Herrmann, Site Vice President, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented three findings of very low safety significance (Green) in this report. Two of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; 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 Regional Administrator, Region IV; and the NRC resident inspector at the Callaway Plant.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, “Public Inspections, Exemptions, Requests for Withholding,” 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

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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 05000483/2015004
w/Attachments:
1. Supplemental Information
2. Request for Information

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/

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

Docket No. 50-483
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Letter to Fadi Diya from Nicholas H. Taylor dated February 11, 2016

SUBJECT: CALLAWAY PLANT – NRC INTEGRATED INSPECTION REPORT 05000483/2015004

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

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| Docket: | 05000483 |
| License: | NPF-30 |
| Report: | 05000483/2015003 |
| Licensee: | Union Electric Company |
| Facility: | Callaway Plant |
| Location: | Junction Highway CC and Highway O<br>Steedman, MO |
| Dates: | September 20 through December 31, 2015 |
| Inspectors: | T. Hartman, Senior Resident Inspector<br>M. Langelier, P.E., Resident Inspector<br>P. Hernandez, Health Physicist<br>J. O'Donnell, CHP, Health Physicist |
| Approved By: | Nicholas H. Taylor<br>Chief, Project Branch B<br>Division of Reactor Projects |

## SUMMARY

IR 05000483/2015004; 09/20/2015 - 12/31/2015; Callaway Plant, Integrated Inspection Report; Maintenance Effectiveness and Identification and Resolution of Problems

The inspection activities described in this report were performed between September 20 and December 31, 2015, by the resident inspectors at the Callaway Plant and inspectors from the NRC's Region IV office. Three findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

**Cornerstone: Initiating Events**

- Green. The inspectors reviewed a self-revealing finding for the licensee's failure to follow plant procedures for the unit reliability team. Specifically, after delaying a modification to the plant's turbine control system, no compensatory measures were implemented to minimize or prevent failure of the system due to aging of the system beyond its evaluated service life as required by plant Procedure APA-ZZ-00549, Appendix E, "Unit Reliability Team Operations."

  The licensee's failure to follow the plant procedure for the unit reliability team was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, as no compensatory measures were implemented after the digital upgrade to the turbine control system was deferred from the spring 2013 refueling outage to the spring 2016 refueling outage, the turbine control system malfunctioned causing a runback of the turbine and downpower transient on the plant. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding has a cross-cutting aspect in the teamwork component of the human performance cross-cutting area because the licensee did not ensure that individuals and work groups communicate across organizational boundaries to ensure nuclear safety is maintained. Specifically, the outage leadership team identified the need for the compensatory measures, but did not communicate the priority nor the effect on nuclear safety to site leadership to gain the resources needed to implement these measures [H.4]. (Section 4OA2.3)

**Cornerstone: Barrier Integrity**

- Green. The inspectors reviewed a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to correct a condition adverse to quality. Specifically, after identifying boric acid deposits on the flange downstream of valve BBV0400, a reactor coolant system boundary valve, the licensee did

not promptly take action to stop the reactor coolant system leakage before it worsened and caused a plant shutdown due to reactor coolant system leakage in excess of technical specification limits. The immediate corrective action was to torque the valve and flange to reduce leakage to within limits. The licensee entered this issue into their corrective action program as Callaway Action Request 201505308.

The licensee's failure to correct the condition adverse to quality (i.e. leakage past valve BBV0400) in a timely manner was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the reactor coolant system equipment and barrier performance attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the failure to correct the reactor coolant system leakage through valve BBV0400 resulted in reactor coolant system leakage worsening and exceeding technical specification limits, and a plant shutdown. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance because after a reasonable assessment of degradation, it could not: 1) result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, or 2) have likely affected other systems used to mitigate a loss of coolant accident resulting in a total loss of their function. This finding has a cross-cutting aspect in the work management component of the human performance cross-cutting area because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee initially planned to address the reactor coolant leakage six months after the issue was identified, and then moved it out an additional three months, failing to prioritize the work commensurate with its safety significance [H.5]. (Section 1R12.1)

- Green. The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 5.4.1, "Procedures," for the licensee's failure to establish, implement, and maintain a procedure recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Specifically, Procedure ODP-ZZ-00022, "Operations Preparation, Performance, and Restoration from Refueling Outages," did not provide adequate guidance to ensure a blind flange located on the reactor coolant system was properly reinstalled resulting in reactor coolant system leakage into containment. The immediate corrective action taken by the licensee was to replace the gasket with a Flexitallic gasket and torque the flange. Additionally, the licensee implemented repetitive maintenance tasks in their work management program to identify flanges removed during an outage and to torque them properly upon reinstallation. The licensee entered this issue into their corrective action program as Callaway Action Request 201505702.

  The licensee's failure to properly establish and maintain Procedure ODP-ZZ-00022 was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the procedure quality performance attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, Procedure ODP-ZZ-00022, did not provide adequate guidance to ensure the blind flange located downstream of valve BBV0400 was properly reinstalled. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety

significance because after a reasonable assessment of degradation, it could not: 1) result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, or 2) have likely affected other systems used to mitigate a loss of coolant accident resulting in a total loss of their function. This finding does not have a cross-cutting aspect because the performance deficiency is not representative of current licensee performance, in that the inadequate instructions were added to the procedure in 2003. (Section 1R12.2)

## PLANT STATUS

Callaway operated at 100 percent power for the duration of the inspection period with the exception of planned power reductions for routine surveillances and post-maintenance testing.

## REPORT DETAILS

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

### 1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Extreme Weather Conditions - Cold Weather Preparations

a. Inspection Scope

On December 10, 2015, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for cold weather and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of cold weather, the licensee had corrected or plans to correct weather-related equipment deficiencies identified during the previous cold weather season.

The inspectors selected two risk-significant systems that were required to be protected from cold weather:

- refueling water storage tank
- ultimate heat sink

The inspectors reviewed the licensee's procedures and design information to ensure the systems would remain functional when challenged by cold weather. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition of the cold weather protection features.

These activities constituted one sample of readiness for seasonal adverse weather, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On November 12, 2015, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions. The inspectors reviewed plant design features, the licensee's procedures to respond to tornadoes and high winds, and the licensee's implementation of these procedures. The inspectors evaluated operator

staffing and accessibility of controls and indications for those systems required to control the plant.

These activities constituted one sample of readiness for impending adverse weather conditions, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

## 1R04 Equipment Alignment (71111.04)

Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- October 8, 2015, train A emergency diesel generator
- October 29, 2015, train B centrifugal charging pump

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the trains were correctly aligned for the existing plant configuration.

These activities constituted two partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

## 1R05 Fire Protection (71111.05)

Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- September 29, 2015, train B emergency diesel generator building, fire area D-2
- October 9, 2015, auxiliary feedwater valve B and C compartment, fire area A-30
- December 15, 2015, auxiliary feedwater valve A and D compartment, fire area A-29
- December 15, 2015, train A mechanical penetration room, fire area A-24

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

**1R06 Flood Protection Measures (71111.06)**

a. Inspection Scope

After reviewing the licensee's flooding analysis, the inspectors chose one plant area containing risk-significant structures, systems, and components that were susceptible to flooding. On December 17, 2015, the inspectors completed an inspection of auxiliary building, elevation 1974' level to evaluate the station's ability to mitigate flooding due to internal causes.

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

In addition, the inspectors selected one underground bunker that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment. On November 4, 2015, the inspectors completed an inspection of train A essential service water electrical manhole (MH01A), Job 14508112, underground bunkers susceptible to flooding.

The inspectors observed the material condition of the cables and splices contained in the bunkers and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constitute completion of one flood protection measures sample and one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

## 1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On November 16, 2015, the inspectors observed an evaluated simulator scenario performed by an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

During the period, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to the activities listed below. The inspectors observed the operators' performance of the following activities:

- December 15, 2015, control room turnover with isolation of train B containment spray pump
- December 29, 2015, at power moderator temperature coefficient measurement

In addition, the inspectors assessed the operators' adherence to plant procedures, including Procedure ODP-ZZ-00001, "Operations Department – Code of Conduct," and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

## 1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed three instances of degraded performance or condition of safety-related structures, systems, and components:

- September 1, 2015, reactor coolant system leakage

- October 21, 2015, train B emergency diesel generator air start system leakage
- November 3, 2015, control building heating ventilation and air conditioning system returned to a(2) status

The inspectors reviewed the extent of condition of possible common cause structure, system, or component failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the structures, systems and components. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

1. Introduction. Inspectors reviewed a self-revealing Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to correct a condition adverse to quality. Specifically, after identifying boric acid deposits on the flange downstream of valve BBV0400, a reactor coolant system boundary, the licensee did not promptly take action to stop the reactor coolant system leakage before it worsened and caused a plant shutdown due to reactor coolant system leakage in excess of technical specification limits.

   Description. On November 29, 2014, during a plant walkdown, the licensee identified boric acid buildup on the bolted flange downstream of valve BBV0400, a drain valve located on the auxiliary spray header. The boric acid corrosion control program owner entered this into the boric acid corrosion control program database. On January 31, February 13, March 11, April 15, and May 21, 2015, the licensee performed follow-up walkdowns on this flange and identified additional boric acid buildup. The licensee entered this issue into their corrective action program on March 2, 2015, after the third identification of boric acid buildup on the flange.

   On March 2, 2015, the licensee initiated Job 15001126 to clean the residue off the flange and stop the source of the boric acid leakage. The licensee initially planned to work the job on September 23, 2015. On May 27, 2015, due to questions with personnel safety, the licensee rescheduled the job to December 3, 2015, when the environment inside containment would be cooler.

   On July 22, 2015, leakage at the flange located downstream of valve BBV0400 increased to a rate of 1.2 gallons per minute which is in excess of the requirements of Technical Specifications 3.4.13, "RCS [Reactor Coolant System] Operational Leakage," for unidentified leakage. This required the licensee to shut down and cool down the plant to repair the leak.

   After the reactor coolant system was depressurized to around 900 psig, the leakage slowed to approximately 90 drops per minute allowing the location of the leak to be determined. Upon investigation, it was determined that the gasket inside the BBV0400

downstream flange had failed allowing the reactor coolant system to vent directly through the valve to the containment atmosphere. The licensee torqued the valve BBV0400 handwheel to 140 ft-lbs gaining an additional one-quarter turn closed. Upon torqueing the valve, the leakage slowed to around 60 drops per minute. The licensee removed the flange, replaced the gasket with a different material, reinstalled the flange, and torqued the flange to its nominal torque value, which stopped the leakage into containment.

Analysis. The licensee's failure to correct the condition adverse to quality (i.e., leakage past valve BBV0400) in a timely manner was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the reactor coolant system equipment and barrier performance attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the failure to correct the reactor coolant system leakage through valve BBV0400 resulted in the reactor coolant system leakage worsening and exceeding technical specification limits, and a plant shutdown. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance because after a reasonable assessment of degradation, it could not: 1) result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, or 2) have likely affected other systems used to mitigate a loss of coolant accident resulting in a total loss of their function. This finding has a cross-cutting aspect in the work management component of the human performance cross-cutting area because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee initially planned to address the reactor coolant leakage six months after the issue was identified, and then moved it out an additional three months, failing to prioritize the work commensurate with its safety significance [H.5].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly corrected. Contrary to the above, on multiple occasions between November 29, 2014, and July 22, 2015, for the quality-related valve BBV0400, to which 10 CFR Part 50 Appendix B applies, the licensee failed to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly corrected. Specifically, when boric acid buildup was discovered on the flange downstream of valve BBV0400, a safety-related valve, the licensee failed to correct the condition in a timely manner. The licensee restored compliance by torqueing the valve and flange to reduce leakage to within limits. Because this finding is of very low safety significance and was entered into the corrective action program as Callaway Action Request 201505308, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2015004-01 "Failure to Promptly Correct a Condition Adverse to Quality on the Reactor Coolant System."

2. Introduction. Inspectors reviewed a Green, self-revealing non-cited violation of Technical Specification 5.4.1, "Procedures," for the licensee's failure to establish,

implement, and maintain a procedure recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Specifically, Procedure ODP-ZZ-00022, "Operations Preparation, Performance, and Restoration from Refueling Outages," did not provide adequate guidance to ensure a blind flange located on the reactor coolant system was properly reinstalled resulting in reactor coolant system leakage into containment.

Description. On November 9, 2014, upon completion of a refueling outage, valve BBV0400, a drain valve located on the pressurizer auxiliary spray line, was closed and the flange downstream of valve BBV0400 was reinstalled in accordance with Workman's Protection Assurance 90470 restoration instructions. Operations personnel installed the gasket and flange then tightened the bolts, but did not torque them to a specific value. The operators tightened the flange to what they believed was an appropriate level of tightness based on their experience, inadvertently overtightening the flange bolts. As a result of overtightening the bolts, the licensee overcrushed the Goretex flange gasket to the point that it could no longer perform its design function. The licensee later determined that had the gasket been crushed appropriately, the flange would not have leaked.

The licensee established Procedure ODP-ZZ-00022, "Operations Preparation, Performance, and Restoration from Refueling Outages," to meet Regulatory Guide 1.33 requirements. Revision 11 of ODP-ZZ-00022 added instructions for torqueing flanged connections in October 2003. Specifically, step 3.20.1.e of this procedure requires that the workman's protection assurance coordinator "review the refuel WPA [workman's protection assurance] to identify all blind flange connections that will be tagged open/flange removed that could affect RCS [reactor coolant system] leakage. The identified flanges will be torqued." This procedure does not, however, identify how to torque the flanges or what method will be used to track the torqueing. Additionally, the procedure does not identify that excessive torqueing might not be appropriate based on the gasket material being used.

On July 22, 2015, the flange located downstream of valve BBV0400, started leaking at a rate of 1.2 gallons per minute, which is in excess of the requirements of Technical Specifications 3.4.13, "RCS [Reactor Coolant System] Operational Leakage," for unidentified leakage. This required the licensee to shut down and cool down the plant to repair the leak. The licensee determined that one of the contributing causes of the reactor coolant leak was that the flange was not properly torqued to obtain the appropriate crush depth on the Goretex gasket. As a corrective action, the licensee replaced the gasket with a Flexitallic gasket which was not susceptible to being overcrushed. Additionally, the licensee implemented repetitive maintenance tasks in their work management program to identify flanges removed during an outage and to torque them upon reinstallation.

Analysis. The licensee's failure to properly establish and maintain Procedure ODP-ZZ-00022 was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the procedure quality attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, Procedure ODP-ZZ-00022 did not provide adequate guidance to ensure the blind flange located downstream of

valve BBV0400 was properly reinstalled. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance because after a reasonable assessment of degradation, it could not: 1) result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, or 2) have likely affected other systems used to mitigate a loss of coolant accident resulting in a total loss of their function. This finding does not have a cross-cutting aspect because the performance deficiency is not representative of current licensee performance, in that the inadequate instructions were added to the procedure in 2003.

Enforcement. Technical Specification 5.4.1 requires, in part, that procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Section 2.k of Appendix A to Regulatory Guide 1.33, Revision 2, requires procedures for preparations for refueling and refueling equipment operations. Contrary to the above, Procedure ODP-ZZ-00022, "Operations Preparation, Performance, and Restoration from Refueling Outages," Revision 40, a procedure established to meet the Regulatory Guide 1.33 requirement, was not properly established or maintained. Specifically, Procedure ODP-ZZ-00022 required individuals to verify flanges that can affect reactor coolant system leakage that are disturbed during a refueling outage be torqued upon reinstallation but did not provide procedural controls for establishing torque values or gasket crush depth. The licensee entered this condition into their corrective action program as Callaway Action Request 201505702. The licensee restored compliance by adding repetitive maintenance tasks to their work management program to identify flanges that are removed during an outage and to torque the flanges upon reinstallation. Because this finding is of very low safety significance and was entered into the corrective action program, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy:
NCV 05000483/2015004-02, "Failure to Properly Establish and Maintain a Plant Procedure for Preparation for Refueling Outages."

## 1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed four risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- September 29, 2015, train A essential service water and emergency diesel generator planned maintenance outage
- October 6, 2015, steam generator A atmospheric dump valve planned maintenance outage
- October 20, 2015, train B emergency diesel generator planned maintenance outage
- November 5, 2015, train A emergency diesel generator planned outage to replace fuel oil day tank inlet check valve

The inspectors verified that these risk assessment were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

These activities constitute completion of four maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

## 1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed three operability determinations and functionality assessments that the licensee performed for degraded or nonconforming structures, systems, or components:

- September 29, 2015, functionality assessment of emergency lighting for train B essential service water pump room and auxiliary building room 1331, Callaway Action Request 201506951
- October 29, 2015, operability determination of load shedding and emergency load sequencing due to automatic test insertion alarms, Callaway Action Request 201507823
- December 10, 2015, operability determination of safety injection accumulator A pressure dropping at a faster rate than the other three accumulators, Callaway Action Request 201508832

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded structures, systems, and components to be operable or functional, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability or functionality. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability or functionality of the degraded structures, systems, or components.

These activities constitute completion of three operability and functionality review samples, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

## 1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed two permanent plant modifications that affected risk-significant structures, systems, and components:

- August 11, 2015, replace Modutronics card in valves ALHV0005 and ALHV0007
- September 23, 2014, screens added to floor drains in multiple rooms, Job 13006754

The inspectors reviewed the design and implementation of the modifications. The inspectors verified that work activities involved in implementing the modifications did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors reviewed the adequacy of the post-modification testing to establish the operability of the structure, system and component as modified.

These activities constitute completion of two samples of permanent modifications, as defined in Inspection Procedure 71111.18.

b. Findings

Several findings were identified for the ALHV0005 and ALHV0007 modification and are discussed in Callaway Plant - NRC Special Inspection Report 05000483/2015009 (ML16013A021).

## 1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed five post-maintenance testing activities that affected risk-significant structures, systems, or components:

- September 30, 2015, train A emergency diesel generator planned maintenance
- October 6, 2015, steam generator A atmospheric dump valve and nitrogen accumulator planned maintenance
- October 21, 2015, train B emergency diesel generator planned maintenance
- November 4, 2015, turbine-driven auxiliary feed valve to steam generator D (ALHV0006) positioner replacement
- November 18, 2015, train B residual heat removal system planned maintenance

The inspectors reviewed licensing-basis and design-basis documents for the systems, structures, and components and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected systems, structures, and components.

These activities constitute completion of five post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

### 1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed three risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the structures, systems, and components were capable of performing their safety functions:

Other surveillance tests:

- November 9, 2015, train B load shedding and emergency load sequencing system automatic test injection surveillance
- November 19, 2015, boric acid control program inspection of rooms 1124, 1125, 1308A, 1308B, 1308C, 7119, 7134, and 7301, Job 15505065
- December 10, 2015, heat flux hot channel factor determination surveillance

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria.

These activities constitute completion of three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

### 1EP6 Drill Evaluation (71114.06)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on October 29, 2015, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the Technical Support Center and simulator, and attended the post-drill critique. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any

emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

**Cornerstones: Public Radiation Safety and Occupational Radiation Safety**

### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

The inspectors assessed the licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities. The inspectors assessed the licensee's implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures. The inspectors walked down various portions of the plant and performed independent radiation dose rate measurements. The inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors reviewed licensee performance in the following areas:

- the hazard assessment program, including a review of the licensee's evaluations of changes in plant operations and radiological surveys to detect dose rates, airborne radioactivity, and surface contamination levels

- instructions and notices to workers, including labeling or marking containers of radioactive material, radiation work permits, actions for electronic dosimeter alarms, and changes to radiological conditions

- programs and processes for control of sealed sources and release of potentially contaminated material from the radiologically controlled area, including survey performance, instrument sensitivity, release criteria, procedural guidance, and sealed source accountability

- radiological hazards control and work coverage, including the adequacy of surveys, radiation protection job coverage and contamination controls, the use of electronic dosimeters in high noise areas, dosimetry placement, airborne radioactivity monitoring, controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools, posting and physical controls for high radiation areas and very high radiation areas

- radiation worker and radiation protection technician performance with respect to radiation protection work requirements

- audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

These activities constitute completion of one sample of radiological hazard assessment and exposure controls as defined in Inspection Procedure 71124.01.

b. Findings

No findings were identified.

**2RS2 Occupational ALARA Planning and Controls (71124.02)**

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements

- ALARA work activity evaluations/post-job reviews, exposure estimates, and exposure mitigation requirements

- the methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies

- records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry

- radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas

- audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

These activities constitute completion of one sample of occupational ALARA planning and controls as defined in Inspection Procedure 71124.02.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security**

### 4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index: High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of fourth quarter 2014 through third quarter 2015 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for high pressure injection systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Residual Heat Removal Systems (MS09)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of fourth quarter 2014 through third quarter 2015 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for residual heat removal systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors verified that there were no unplanned exposures or losses of radiological control over locked high radiation areas and very high radiation areas during the period of October 1, 2014, to September 30, 2015. The inspectors reviewed a sample of radiologically controlled area exit transactions showing exposures greater than

100 mrem. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the occupational exposure control effectiveness performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed corrective action program records for liquid or gaseous effluent releases that occurred between October 1, 2014, and September 30, 2015, and were reported to the NRC to verify the performance indicator data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

## 4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

To verify that the licensee was taking corrective actions to address identified adverse trends that might indicate the existence of a more significant safety issue, the inspectors reviewed corrective action program documentation associated with the following licensee-identified trends:

- a negative trend involving malfunctions of the spent fuel building bridge crane (Callaway Action Request 201506172)

- a negative trend involving consequential failures of AP-913 equipment (Callaway Action Request 201506340)

These activities constitute completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Observations and Assessments

The inspectors' review of the trends identified above produced the following observations and assessments:

- For the negative trend involving malfunctions of the spent fuel building bridge crane, the licensee performed an evaluation of the causes for the negative trend. The licensee identified that some of the problems are attributed to out of date analog technology and has developed a health issue to evaluate upgrading the system to a digital platform. They also identified that some cabling is damaged due to normal wear and are working on creating a preventative maintenance task to replace the cable before it wears out.

  The inspectors considered that in response to this trend the licensee had completed an appropriate evaluation and had developed appropriate planned corrective actions.

- For the negative trend involving consequential failures of AP-913 equipment, the licensee identified 21 failures of AP-913 equipment within the last two years. With the help of an external organization, the licensee determined two primary drivers of the trend: Right Picture and Ownership. The licensee is focused on reestablishing the focus on equipment reliability, restrengthening the behaviors to drive equipment excellence, and implementing a communication plan for cross-department interactions. At the end of the inspection period, these actions were ongoing.

  The inspectors considered that in response to this trend the licensee had developed appropriate planned corrective actions.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

On January 31, 2015, the inspectors selected unexpected load reject when changing turbine controls, Callaway Action Request 201500737, for an in-depth follow-up.

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of one annual follow-up sample as defined in Inspection Procedure 71152.

b. Findings

Introduction. Inspectors reviewed a self-revealing Green finding for the licensee's failure to follow the plant procedures for the unit reliability team. Specifically, after delaying a modification to the plant's turbine control system, no compensatory measures were implemented to minimize or prevent failure of the system due to aging of the system beyond its evaluated service life.

Description. On January 31, 2015, while performing turbine control testing, the turbine unexpectedly lowered electrical output from approximately 1250 MWe to approximately 780 MWe. This resulted in the condenser steam dumps opening due to a primary to secondary power mismatch. Operations personnel stabilized the plant and restored steam flow through the main turbine control valves, which allowed the condenser steam dumps to close as expected. The plant stabilized in a normal lineup at approximately 60 percent power. About an hour after the plant was stabilized, the turbine load starting reducing a second time. Operations personnel lowered the load limit setpoint until the load limit was limiting turbine load. The plant reached stable conditions at approximately 53 percent power.

On February 1, 2015, the licensee intentionally lowered power to approximately 46 percent power and placed the turbine control system in standby to support troubleshooting of the turbine control system. Troubleshooting identified intermittent noise in the load set circuitry caused by a +22 V permanent magnet generator power supply and a high resistance connection on the power supply bus due to the bad seating of a load limit and load set runback card.

The licensee's investigation revealed that a decision was made in 2005 to upgrade the system to a digital platform because of aging and obsolescence of the system components. The system life at that time was approximately 25 years (2008) and technical justification was given to continue using the system for up to 30 years (through 2013). In 2012, the unit reliability team decided to delay the digital upgrade from the spring 2013 refueling outage, to the spring 2016 refueling outage, which effectively extended the operating life to 33 years. The decision to delay the design change was based on the resource requirements of the project and probability of system failure. This decision was made with the knowledge of the upgrade project engineer, but

communication with the system engineer to ensure his awareness of the delay was lacking.

Procedure APA-ZZ-00549, Appendix E, "Unit Reliability Team Operations," Revision 7, step 4.9.8 states, "If implementation of an approved solution is delayed, URT Chair: DIRECT the issue Owner/Project Sponsor to determine IF any intermediate or compensatory measures should be put in place to ensure continued reliability until the solution can be implemented."

In February 2014, the system engineer presented compensatory actions to the outage leadership team for inclusion in the fall 2014 refueling outage. This request to add the actions was denied by the outage leadership team due to lack of resources. The outage leadership team did not discuss the need for the compensatory measures with the unit reliability team to acquire the necessary resources. After that time, the upgrade was deferred to the spring 2019 refueling outage, effectively extending the operating life to 36 years without identification of any compensatory measures to reduce the probability of a failure in the plant.

Corrective actions include implementing a bridging strategy to lower the risk to the safe and reliable operation of the turbine control system until the system is replaced with a new digital control system. The bridging strategy includes replacing power supplies and cards within the system to increase the overall reliability of the system.

Analysis. The licensee's failure to follow the plant procedure for the unit reliability team was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, as no compensatory measures were implemented after the digital upgrade to the turbine control system was deferred from the spring 2013 refueling outage to the spring 2016 refueling outage, the turbine control system malfunctioned causing a runback of the turbine and downpower transient on the plant. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding has a cross-cutting aspect in the teamwork component of the human performance cross-cutting area because the licensee did not ensure that individuals and work groups communicate across organizational boundaries to ensure nuclear safety is maintained. Specifically, the outage leadership team identified the need for the compensatory measures, but did not communicate the priority nor the effect on nuclear safety to site leadership to gain the resources needed to implement these measures [H.4].

Enforcement. This finding does not involve enforcement action because no violation of a regulatory requirement was identified. Because this finding does not involve a violation and is of very low safety significance, it is identified as FIN 05000483/2015004-03, "Failure to Follow Plant Procedure for Unit Reliability Team."

## 4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 05000483/2014-002-00, Operation Outside of Pressure and Temperature Limits Report Curve Required by Technical Specification 3.4.3

On January 14, 2014, the Callaway Plant discovered that on two occasions during the previous three years, Condition C of Technical Specifications 3.4.3, "Reactor Coolant System Pressure and Temperature Limits," was not entered when the reactor coolant system pressure was below 0 pounds per square inch gauge (psig). This occurred while the reactor coolant system was vacuum filled during both of the refueling outages (Refueling Outage 18 and Refueling Outage 19) at Callaway in the three years prior to the discovery. The reactor pressure/temperature curves in the Callaway Pressure and Temperature Limits Report have a minimum pressure value of 0 psig referenced on the curve. All systems performed as designed during the time that reactor coolant system pressure was below 0 psig during the two vacuum fill evolutions.

The licensee evaluated the impacts of drawing a vacuum on the structural integrity of the reactor coolant system. The licensee determined the calculated minimum wall thickness for the reactor coolant system components to withstand full vacuum (0 pounds per square inch absolute (psia)) is below the existing wall thickness of the reactor vessel, pressurizer, steam generator tubes, and the reactor coolant system piping. Additionally, the licensee determined that the execution of the reactor coolant system vacuum fill and vent procedure to reduce reactor coolant system pressure up to and including full vacuum will not adversely affect the integrity of reactor coolant system components.

Licensee Event Report 2014-002-00 was submitted pursuant to Title 10 of the *Code of Federal Regulations* 50.73(a)(2)(i)(B) as a condition prohibited by technical specifications based on the reactor coolant system pressure being outside of the prescribed pressure and temperature limits. The inspectors reviewed the licensee's submittal and determined that the report included the potential safety consequences and necessary corrective actions, and thoroughly documented the event.

The licensee conducted a causal analysis and determined the causes for this issue were the inaccurate perception that the pressure and temperature limits report curves only applied during reactor coolant system heat-up or cooldown and the reliance on an engineering evaluation of the reactor coolant system under vacuum conditions to allow continued operation.

As part of the licensee's corrective actions, the licensee updated their engineering analysis basis for the pressure and temperature limits report to include reactor coolant system pressure down to 0 psia and updated the pressure and temperature limits report to allow operation down to 0 psia. The updated pressure and temperature limits report was provided to the NRC in accordance with the requirements of Technical Specification 5.6.6.c., "Reporting Requirements."

The inspectors determined during their review of Licensee Event Report 2014-002-00 that the activities described in this licensee event report did not represent a violation of Technical Specification 3.4.3. However, the inspectors concluded that the operation of the reactor coolant system outside of the parameters of the pressure and temperature limits report analysis involved a minor violation of Technical Specification 5.4.1.a. Technical Specification 5.4.1.a requires, in part, that procedures shall be established,

implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Section 3.a of Appendix A to Regulatory Guide 1.33, Revision 2, requires procedures for filling and venting of the reactor coolant system. The licensee established Procedure OTN-BB-00001, "Reactor Coolant System – IPTE," for the reactor coolant system vent and fill. This procedure was not appropriately maintained in that it allowed reactor coolant system pressure during the two reactor coolant system fill and vent evolutions (on November 15-16, 2011, and May 13, 2013) to be less than 0 psig, outside of the pressure parameter inputs to the analysis that is the basis for the pressure/temperature limit curves of Technical Specification 3.4.3. This violation was determined to be of minor safety significance because it could not reasonably be viewed as a precursor to a significant event; if left uncorrected, would not have the potential to lead to a more significant safety concern; it does not relate to a performance indicator; and it did not adversely affect a reactor oversight process cornerstone objective. Specifically, the licensee's analysis showed that there is no impact on reactor coolant system integrity when the reactor coolant system is under vacuum conditions. This issue was entered into Callaway Plant's corrective action program as Callaway Action Request 201400240. This failure to comply with Technical Specification 5.4.1.a constitutes a minor violation that is not subject to enforcement action in accordance with NRC's Enforcement Policy. This licensee event report is closed.

2. (Closed) Licensee Event Report 05000483/2014-003-02, Inverter NN11 Inadvertently Transferred to its Alternate AC Source

   On June 9, 2014, Callaway Plant was in Mode 1 operating at 100 percent rated thermal power when, during a maintenance activity, inverter NN11 unexpectedly transferred from its normal direct current (DC) source to its bypass alternating current (AC) source. Inspectors previously reviewed Licensee Event Report 05000483/2014-003-00 and 05000483/2014-003-01 associated with this event. Documentation of this review was provided in NRC Integrated Inspection Report 05000483/2015002 (ML15217A538). The second revision to the licensee event report included additional information in the event description regarding the momentary deenergization of an instrumentation control power cabinet. No findings or violations of NRC requirements were identified associated with the revised event report. This licensee event report is closed.

3. (Closed) Licensee Event Report 05000483/2014-005-00/01, All ECCS [Emergency Core Cooling System] Accumulator Isolation Valve Operator Breakers Closed in Mode 3 with RCS [Reactor Coolant System] Pressure Greater than 1000 PSIG

   On November 18, 2014, leak testing was being performed on the emergency core cooling system accumulator isolation valves (EPHV8808A, EPHV8808B, EPHV8808C, EPHV8808D) while the plant was in Mode 3 and reactor coolant system pressure was above 1000 psig. During the testing, at 5:34 p.m., the supply breakers for all four of the isolation valve motor-operators were closed. This action had the unintended result of rendering all four emergency core cooling system accumulators inoperable. The condition was identified at 7:00 p.m., and Technical Specifications 3.5.1, "Accumulators," Limiting Condition for Operation, Condition D was entered. Per Required Action D.1, Technical Specification Limiting Condition for Operation 3.0.3 was immediately entered. By 7:30 p.m., three emergency core cooling system accumulators had been restored to operable with their isolation valves open and power removed from the isolation valve

motor-operators, and Technical Specifications Limiting Condition for Operation 3.0.3 was exited.

Licensee Event Reports 2014-005-00 and 2014-005-01 were submitted pursuant to 10 CFR 50.73(a)(2)(v)(A), 50.73(a)(2)(v)(B), 50.73(a)(2)(v)(D), and 50.73(a)(2)(vii) as a condition that could have prevented the fulfillment of a safety function needed to shut down the reactor and maintain it in a safe shutdown condition, remove residual heat, or mitigate the consequences of an accident; and as an event where a single cause or condition caused two independent trains to become inoperable in a single system designed to shut down the reactor and maintain it in a safe shutdown condition, remove residual heat, or mitigate the consequences of an accident. The inspectors reviewed the licensee's submittal and determined that the report included the potential safety consequences and necessary corrective actions, and thoroughly documented the event.

The licensee conducted a causal analysis and determined the cause for this issue was the failure of operations personnel to comply verbatim with the leak testing procedure. As part of the licensee's corrective actions, requirements for verbatim compliance with continuous use procedures have been reinforced within Callaway's Operations Department and the leak testing procedure has been revised to clearly specify that removal of power from the isolation valve motor-operator is required for operability of each emergency core cooling system accumulator.

A licensee-identified violation associated with this event is documented in Section 4OA7 of NRC Integrated Inspection Report 05000483/2014005 (ML15036A620). This licensee event report is closed.

These activities constitute completion of three event follow-up samples, as defined in Inspection Procedure 71153.

## 4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 30, 2015, the inspectors presented the radiation safety inspection results to Mr. B. Cox, Senior Director, Nuclear Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On January 11, 2015, the inspectors presented the inspection results to Mr. T. Herrmann, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

Licensee Personnel

F. Bianco, Director, Nuclear Operations
B. Cox, Senior Director, Nuclear Operations
K. Dolman, Senior, Technician, Radiation Protection
M. Fletcher, Engineer, Fire Protection
J. Geyer, Manager, Radiation Protection
J. Houston, Senior Health Physicist, Radiation Protection
G. Hurla, Supervisor, Radiation Protection
V. Miller, Supervising Health Physicist, Radiation Protection
S. Petzel, Engineer, Regulatory Affairs
N. Traub, Senior Technician, Radiation Protection
T. Trent, Health Physicist, Radiation Protection
D. Turley, Supervisor, Engineering Systems
T. Witt, Engineer, Regulatory Affairs

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

Opened and Closed

| | | |
|---|---|---|
| 05000483/2015004-01 | NCV | Failure to Promptly Correct a Condition Adverse to Quality on the Reactor Coolant System (Section 1R12.1) |
| 05000483/2015004-02 | NCV | Failure to Properly Establish and Maintain a Plant Procedure for Preparation for Refueling Outages (Section 1R12.2) |
| 05000483/2015004-03 | FIN | Failure to Follow Plant Procedure for Unit Reliability Team (Section 4OA2.3) |

Closed

| | | |
|---|---|---|
| 05000483/2014-002-00 | LER | Operation Outside of Pressure and Temperature Limits Report Curve Required by Technical Specification 3.4.3 (Section 4OA3.1) |
| 05000483/2014-003-02 | LER | Inverter NN11 Inadvertently Transferred to its Alternate AC Source (Section 4OA3.2) |
| 05000483/2014-005-00/01 | LER | All ECCS Accumulator Isolation Valve Operator Breakers Closed in Mode 3 with RCS Pressure Greater than 1000 PSIG (Section 4OA3.3) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Protection

Procedures

| Number | Title | Revision |
|---|---|---|
| OTN-QJ-00003, Addendum 3 | Alarm Response Procedure, BN181, RWST Freeze Protection Control Panel | 0 |
| OTO-ZZ-00012 | Severe Weather | 32 |
| OTS-ZZ-00007 | Plant Cold Weather | 31 |

Callaway Action Requests

201508387 201508824

Jobs

| | | | | |
|---|---|---|---|---|
| 12005394 | 13001250 | 14004781 | 14004885 | 14510142 |
| 14510703 | 14512223 | 14513389 | 14513460 | 15500222 |
| 15500261 | 15002912 | 15004375 | 15004552 | 15004685 |
| 15004686 | 15004687 | 15004693 | 15004788 | 15005060 |
| 15005375 | | | | |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| M-EF-17 | Calculation to Determine Heat Input Required for Freeze Protection of the UHS Cooling Tower Outlet Sumps | 0 |

### Section 1R04: Equipment Alignment

Procedures

| Number | Title | Revision |
|---|---|---|
| EOP ADD 9 | Placing Diesel Generators in Standby | 1 |
| EOP ADD 21 | Local Start of Emergency Diesel Generators | 2 |
| OTN-BG-00001, Checklist 2 | Letdown and Charging Valve Lineup | 34 |
| OTN-BG-00001, Checklist 5 | BG Control Switch Lineup | 36 |
| OTN-BG-00001, Checklist 6 | Boron Thermal Regeneration System Control Room Lineup | 34 |

Procedures

| Number | Title | Revision |
|---|---|---|
| OTN-BG-00001, Checklist 7 | BG Breaker Lineup | 34 |
| OTN-NE-0001A | Standby Diesel Generation System – Train A | 46 |

Drawings

| Number | Title | Revision |
|---|---|---|
| E-2R5112(Q) | Raceway Plan Diesel Generator Building Elevation 2000'-0" | 15 |
| M-22GM01 (Q) | Diesel Generator Building HVAC P&ID | 3 |
| M-22KJ01 (Q) | Standby Diesel Generator A Cooling Water System P&ID | 24 |
| M-22KJ02 (Q) | Standby Diesel Generator A Intake Exhaust, Fuel Oil, and Starting Air System P&ID | 20 |
| M-22KJ03 (Q) | Standby Diesel Generator A Lube Oil System P&ID | 20 |
| M-2Y005 | Vapor and Dust Seal | 1 |
| M-2Y006A | Electrical Equipment – Vapor & Dust Seals | 2 |
| M-2Y006C | Electrical Equipment – Vapor & Dust Seals | 3 |
| 10466-M663-0102-02 | Vapor and Dust Seals Typical DS-3A, DS-4A, DS-5A | 2 |

Callaway Action Requests

201307763 201400020

Jobs

10008641 13000678 13003948

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| M-627A-00078B | NH90 Series Hydramotors Model B & Model B1 Maintenance Manual | 15 |
| M-721-00093 | Westinghouse Operation and Maintenance Manual for Charging/Safety Injection Pump | 241 |
| | Preventative Maintenance Background Information Document for Pressure Safety (Relief) Valves, Vacuum Breakers and Rupture Disks | 2 |

**Section 1R05: Fire Protection**

Procedures

| Title | Revision |
|---|---|
| Fire Preplan Manual | 39 |

Drawings

| Number | Title | Revision |
|---|---|---|
| E-2R1354(Q) | Conduit Plan Area-5 Auxiliary Building El. 2013'6" – El. 2026'0" | 12 |
| E-23AB06B(Q) | Main Steam Atmospheric Vent Valve Position Indicating Lights Schematic Diagram | 8 |
| E-23AB20B(Q) | Miscellaneous Circuits Schematic Diagram | 4 |
| J-110-00218 | Main Steam System Atmospheric Steam Dump Steam Generator B Instrument Loop Diagram | 10 |
| J-110-00219 | Main Steam System Atmospheric Steam Dump Steam Generator B Instrument Loop Diagram | 11 |
| J-110-00933 | Main Steam System Atmospheric Steam Dump Steam Generator B Instrument Loop Diagram | 5 |
| M-22AB01(Q) | Main Steam System Piping and Instrumentation Diagram | 22 |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| KC-26 | Nuclear Safety Capability Assessment | 1 |
| KC-76 | D-2 Detailed Fire Modeling Report | 0 |
| KC-104 | Fire Safety Analysis for Fire Area A-24 | 1 |
| KC-109 | Fire Safety Analysis for Fire Area A-29 | 1 |
| KC-110 | Fire Safety Analysis for Fire Area A-30 | 1 |
| KC-150 | Fire Safety Analysis for Fire Area D-2 | 1 |
| ME-014 | Detailed Fire Modeling Design Guide | 0 |
| 17671-FRE-A-24 | Fire Evaluation of Delta Risk for Fire Area A-24 | 0 |
| 17671-FRE-A-29 | Fire Evaluation of Delta Risk for Fire Area A-29 | 0 |
| 17671-FRE-A-30 | Fire Evaluation of Delta Risk for Fire Area A-30 | 0 |

**Section 1R06: Flood Protection Measures**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00750 | Hazard Barrier Program | 36 |

Drawings

| Number | Title | Revision |
|---|---|---|
| E-2R1113(Q) | Exposed Conduit Auxiliary Building Area-1 Elevation 1974'0" | 10 |
| GM-AB1974 | Callaway Plant Auxiliary Building Grid Map Floor Elevation 1974' | A |

Callaway Action Requests

201105608 201504538

Jobs

14508112

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| M-FL-01 | Flooding of the Auxiliary Building (Seismic Event) | 2A |
| M-FL-06 | Auxiliary Building Flooding Due to Pipe Break (No Seismic Event) | 0 |
| SK-06 | Aux & Control Building Flood Analysis | 1 |
| | Night Order - Callaway Action Request 201504538 – AB 1974' Revised Flooding Analysis | October 29, 2015 |

**Section 1R11: Licensed Operator Requalification Program**

Procedures

| Number | Title | Revision |
|---|---|---|
| ODP-ZZ-00001, Addendum 2 | Shift Briefs | 12 |
| ODP-ZZ-00001, Addendum 11 | Control Room Decorum | 12 |
| ODP-ZZ-00003 | Shift Relief and Turnover | 35 |
| ESP-ZZ-00010 | At-power Moderator Temperature Coefficient Measurement | 25 |

Miscellaneous

| Title | Date |
|---|---|
| Dynamic Simulator Exam Scenario, 2015-6 As Found #1 | October 8, 2015 |

**Section 1R12: Maintenance Effectiveness**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00322, Appendix B | Work Week Schedule and Execution | 46, 48 |
| APA-ZZ-00322, Appendix F | Online Work Integrated Risk Management | 6, 7, 9 |
| EDP-ZZ-01004 | Boric Acid Corrosion Control Program | 17 |
| EDP-ZZ-01128 | Maintenance Rule Program | 24 |
| EDP-ZZ-01128 Appendix 2 | Summary of Structure, System and Component Performance Criteria | 28 |
| EDP-ZZ-04015 | Evaluating and Processing Requests for Resolution | 23 |
| ODP-ZZ-00022 | Operations Preparation, Performance, and Restoration From Refueling Outages | 40 |
| QCP-ZZ-05048 | Boric Acid Walkdown for Reactor Coolant System Pressure Boundary | 9 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22BB02 | Piping and Instrument Diagram – Reactor Coolant System | 33 |

Callaway Action Requests

| | | | | |
|---|---|---|---|---|
| 199400952 | 200205497 | 200405708 | 201208791 | 201300535 |
| 201302166 | 201402787 | 201404221 | 201404656 | 201407757 |
| 201408399 | 201500601 | 201501125 | 201501221 | 201502523 |
| 201502787 | 201503414 | 201504128 | 201504294 | 201505308 |
| 201505339 | 201506025 | | | |

Jobs

| | | | | |
|---|---|---|---|---|
| 07010329 | 12002421 | 12005662 | 13003202 | 13003320 |
| 13006173 | 14005357 | 14005857 | 15001126 | 15001650 |

Jobs

15002532 15004852

Miscellaneous

| Number | Title | Date |
|---|---|---|
| RFR 015650A | Allow the Use of Gore-Tex Sheet Gasket Material | January 30, 1995 |
| RFR 015650B | Expand Testing of Gasket Sites From Those of Rev A | March 28, 1995 |
| RFR 015650C | Allow the Use of Gore-Tex Gasket Material Generically | August 26, 1996 |
| Night Order | CAR 201404221 B EDG Starting Air System Air Leak | April 9, 2015 |

**Section 1R13: Maintenance Risk Assessment and Emergent Work Controls**

Procedures

| Number | Title | Revision |
|---|---|---|
| EDP-ZZ-01129 | Callaway Energy Center Risk Assessment | 44 |
| ODP-ZZ-00002 | Equipment Status Control | 79 |
| ODP-ZZ-00002, Appendix 1 | Protected Equipment Program | 23 |
| ODP-ZZ-00002, Appendix 2 | Risk Management Actions for Planned Risk Significant Activities | 10 |
| ODP-ZZ-00002, Appendix 2, Checklist 1 | Door Postings for A Train Essential Service Water and/or Emergency Diesel Generator being Out of Service | 1 |

Jobs

14001228

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| ARC-1283 | Pipe Stress Analysis in Support of Removal of JEV0085 and Anchor JE02-A503 | 0 |
| RFR 201507456 | Evaluate Emergency Diesel Generator System Impact During Replacement of JEV0085 | 0 |

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| | Night Shift Manager Operational Focus Items | September 29, 2015 |
| | Night Shift Manager Operational Focus Items | November 5, 2015 |
| | Safety Monitor Results for Week of September 28th | 0 |
| | Safety Monitor Results for Week of October 19th | 0 |

**Section 1R15: Operability Evaluations**

Procedures

| Number | Title | Revision |
|---|---|---|
| ISP-NF-00002 | Loop-Miscellaneous; NF039B Relay Driver Test | 7 |
| OTA-RK-00016 Addendum 31B | NF039B Test Trouble | 4 |

Drawings

| Number | Title | Revision |
|---|---|---|
| J-104-00008 | Engineered Safety Features Actuation System – Relay Driver Schematic | 4 |
| J-104-00168 | Engineered Safety Features Actuation System – Load Shed Relay Outputs | 19 |
| J-104-00169 | Sequencer Relay Outputs | 18 |

Callaway Action Requests

| | | | | |
|---|---|---|---|---|
| 199201472 | 200806087 | 200807867 | 200808299 | 201506951 |
| 201506989 | 201507823 | 201508258 | 201508296 | |

Jobs

| | |
|---|---|
| 15503185 | 15004723 |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| J-104-00347 | Instruction Manual for Installation, Operation, and Maintenance of Engineered Safety Features Actuation System and Load Shedder and Emergency Load Sequencer | 20 |
| KC-26 | NFPA 805 Nuclear Safety Capability Assessment | 1 |
| LDCN 11-0012 | 200906584 Process License Amendment Request and Associated Licensing Document Revisions to Transition to NFPA 805 Fire Protection Plan | 0 |
| LDCN 11-0026 | 200906584 Process License Amendment Request and Associated Licensing Document Revisions to Transition to NFPA 805 Fire Protection Plan | 0 |
| | Operating Quality Assurance Manual | 31 |

**Section 1R18: Plant Modifications**

Drawings

| Number | Title | Revision |
|---|---|---|
| M-2P1421 | Drainage Systems (LF&LE) Auxiliary Building El. 2026'-0" Area 2 | 1 |
| M-2P1431 | Drainage Systems (LF) Auxiliary Building El. 2026'-0" Area 3 | 1 |
| M-2P1441 | Drainage Systems (LE&LF) Auxiliary Building El. 2026'-0" Area 4 | 1 |

Callaway Action Requests

| | | | | |
|---|---|---|---|---|
| 201100565 | 201403629 | 201408899 | 201503968 | 201505796 |

Jobs

13006754

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| RFR 201100565 | 50.59 Screening for Replacement for Modutronics 10A Controller Cards MIN 7671450 | May 2014 |
| RFR 201304731 | Procure Alternate Floor Drain Covers for Selected Areas | 0 |
| RFR 201503968 | Approve Revised NLI-10A-LM-P | July 21, 2015 |

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| | Run Time Determination for ALHV0005 and ALHV0007 | |

**Section 1R19: Post-Maintenance Testing**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00356 Appendix 1 | Maximum Allowable Stroke Time | 3 |
| ISL-AB-000P1 | Loop-Pressure: S/G A Pressure Operated Relief Valve | 8 |
| ITM-ZZ-VT001 | Diagnostic Calibration and Testing of Modulating Air Operated Valves | 20 |
| OSP-AB-V002A | Steam Generator Atmospheric Steam Dump Valves Inservice Test | 43 |
| OSP-AL-V001C | Turbine-Driven Auxiliary Feedwater Inservice Test | 56 |
| OSP-EJ-P001B | Residual Heat Removal Train B Inservice Test – Group A | 58 |
| OSP-KA-V0003 | Nitrogen Accumulator Inservice Leak Rate Test | 28 |
| OSP-NE-0001A | Standby Diesel Generator A Periodic Tests | 59 |
| OSP-NE-0001B | Standby Diesel Generator B Periodic Tests | 62 |
| OSP-RP-00002 | Auxiliary Shutdown Panel Controls Test | 19 |

Drawings

| Number | Title | Revision |
|---|---|---|
| E-23KJ12 (Q) | Generator Space Heater Schematic Diagram | 3 |

Callaway Action Requests

| | | | | |
|---|---|---|---|---|
| 200307326 | 200603104 | 200607951 | 200700921 | 201309436 |

Jobs

| | | | | |
|---|---|---|---|---|
| 09509202 | 10008817 | 10502300 | 10508108 | 10508695 |
| 10508743 | 10517444 | 11501420 | 12512617 | 12512618 |
| 13006072 | 13502829 | 13502830 | 14001228 | 14001339 |
| 14002410 | 14005357 | 14006537 | 14500750 | 14501964 |
| 14502013 | 14503069 | 14505342 | 14505350 | 14508545 |

Jobs

| | | | | |
|---|---|---|---|---|
| 15002079 | 15002319 | 15004318 | 15506859 | 15509258 |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| RFR 200600807 | Evaluate Increasing Maximum Open Stroke Time for ALHV0006, ALHV0008, ALHV0010, & ALHV0012 | 0 |

**Section 1R22: Surveillance Testing**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00340 | Surveillance Program Administration | 38 |
| EDP-ZZ-01004 | Boric Acid Corrosion Control Program | 18 |
| ISP-NF-00002 | Loop-Miscellaneous; NF039B Relay Driver Test | 7 |
| OSP-ZZ-00001 | Control Room Shift and Daily Log Readings and Channel Checks | 86 |
| OTA-RK-00016 Addendum 31B | NF039B Test Trouble | 4 |
| OTN-LF-00001 Addendum 12 | Room 1124 Groundwater Inleakage | 0 |
| OTS-ZZ-06032 | Leak Collection Devices | 6 |
| ESP-ZZ-00004 | Flux and Thermocouple Mapping | 15 |
| ESP-ZZ-00014 | Heat Flux Hot Channel Factor | 35 |
| ETP-ZZ-00062 | Flux Map Analysis With BEACON | 6 |

Callaway Action Requests

| | | | | |
|---|---|---|---|---|
| 200403563 | 200101780 | 201507823 | 201508258 | 201508296 |
| 201508783 | | | | |

Jobs

| | |
|---|---|
| 15004723 | 15505065 |

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| IEEE 338 | IEEE Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems | 1975, 1987 & 2012 |
| | BEACON Surveillance Summary Report | December 9, 2015 8:35 a.m. |
| | BEACON Surveillance Summary Report | December 9, 2015 10:30 a.m. |
| | Callaway Energy Center Surveillance Tracking Manual | 26 |

**Section 1EP6: Drill Evaluation**

Callaway Action Requests

201507990

Miscellaneous

| Title | Date |
|---|---|
| 2015 Off Hour Drill Guide | October 29, 2015 |

**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00014 | Conduct of Operations - Radiation Protection | 22 |
| APA-ZZ-01000 | Radiation Protection Program | 41 |
| APA-ZZ-01004 | Radiological Work Standards | 27 |
| HDP-ZZ-01200 | Radiation Work Permits | 27 |
| HDP-ZZ-01500 | Radiological Postings | 44 |
| HDP-ZZ-03000 | Radiological Survey Program | 42 |
| HDP-ZZ-03000, Appendix A | Frequency and Location of Routine Radiological Surveys | 13 |
| HDP-ZZ-06100 | Reactor Building Access | 26 |
| HTP-ZZ-00001 | Radioactive Sealed Source Leak Check Surveillance | 15 |
| HTP-ZZ-02004 | Control of Radioactive Sources | 39 |

Procedures

| Number | Title | Revision |
|---|---|---|
| HTP-ZZ-02004-DTI-Sources-Disp | Radioactive Source Disposal | 1 |
| HTP-ZZ-02004-DTI-Sources-Receipt | Radioactive Source Receipt | 1 |
| HTP-ZZ-02023 | Unconditional Release of Material from Radiological Controls | 17 |
| HTP-ZZ-06034 | Resin Sluice | 9 |
| RP-DTI-Sources-Inv-Act | Accountable Radioactive Source Inventory | 2 |
| RP-DTI-Sources-Inv-Cst | Custodial Radioactive Source Inventory | 0 |

Corrective Action Reports

| | | | | |
|---|---|---|---|---|
| 201407661 | 201407707 | 201407979 | 201408003 | 201500525 |
| 201500538 | 201500783 | 201500806 | 201501180 | 201501212 |
| 201501627 | 201501816 | 201503407 | 201503419 | 201504187 |
| 201505138 | 201505172 | 201505335 | 201505569 | 201506208 |
| 201506720 | 201506987 | 201507198 | | |

Audits and Self-Assessments

| Number | Title | Date |
|---|---|---|
| AP15-002 | Nuclear Oversight Audit of Radiation Protection | February 23, 2015 |

Radiation Work Permits

| Number | Title | Revision |
|---|---|---|
| 15002019 | Verify/Adjust the Limits for LFLV0098 for Proper Operation | 1 |
| 15505690 | Sample, Sluice, and Refill Demineralizer FEC03 | 1 |
| 15510988350 | Remove Resin Fillhead | 0 |

Radiation Surveys

| Number | Title | Date |
|---|---|---|
| CA-M-20150731-2 | Fuel Pool Heat Exchanger A | July 31, 2015 |

Radiation Surveys

| Number | Title | Date |
|---|---|---|
| CA-M-20150909-3 | Normal Charging Pump Room | September 9, 2015 |
| CA-M-20150923-15 | Containment Personnel Hatch | September 23, 2015 |
| CA-M-20151006-12 | South Piping Pen | October 6, 2015 |
| CA-M-20151009-5 | ISFSI Yard Tech Spec Survey - CEC-42 | October 9, 2015 |
| CA-M-20151014-7 | Advanced Liquid Processing System Processing Area | October 14, 2015 |
| CA-M-20151015-2 | ISFSI Pad Quarterly Survey | October 15, 2015 |

Airborne Activity Concentration Worksheets

| Sample Number | RWP or Sample Reason | Date |
|---|---|---|
| 150723-0807 (NG) | Containment Entry – RWP 15003174 | July 23, 2015 |
| 150723-1121 (NG) | Containment Entry – RWP 15003174 | July 23, 2015 |
| 150724-0008 (NG) | Containment Entry | July 24, 2015 |

Miscellaneous Documents

| Number | Title | Date |
|---|---|---|
| | Accountable Source List for NRC 2015 | |
| | Custodial Sources NRC 2015 | |
| | July 2015 Leak Tests | |
| 14507514 | Semi-Annual Source Inventory | January 13, 2015 |
| 15500734 | Semi-Annual Source Inventory | July 27, 2015 |

**Section 2RS2: Occupational ALARA Planning and Controls**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-01001 | Callaway Plant ALARA Program | 24 |
| APA-ZZ-01020 | Primary Chemistry Program | 27 |
| HDP-ZZ-01100 | ALARA Planning and Review | 18 |
| HDP-ZZ-01200 | Radiation Work Permits | 27 |
| HDP-ZZ-03000 | Radiological Survey Program | 42 |
| HDP-ZZ-06001 | Radiation Protection Department Calculations | 7 |
| HTP-ZZ-01433-DTI-Annual Reports | Dosimetry Annual Reports | 2 |
| HTP-ZZ-06001 | High Radiation/Locked High Radiation/Very High Radiation Area Access | 50 |
| HTP-ZZ-06019 | Diving Operations | 18 |
| MDP-ZZ-0STOR | Staging And Storage Of Materials, Equipment and Tools Within The Switchyard, Under The Electric Distribution Lines, Protected Area, Alternate Energy Power System And Power Block | 18 |
| PDP-ZZ-00023 | Work Screening and Processing | 31 |

Corrective Action Reports Corrective Action Reports

| | | | | |
|---|---|---|---|---|
| 201407541 | 201408416 | 201500451 | 201500620 | 201500844 |
| 201501222 | 201501268 | 201501520 | 201501538 | 201501830 |
| 201502756 | 201502946 | 201506127 | | |

Audits and Self-Assessments

| Number | Title | Date |
|---|---|---|
| 201500405-06 | ALARA Plans, Packages and RWPs | June 22, 2015 |
| AP15-002 | Nuclear Oversight Audit of Radiation Protection | February 23, 2015 |

ALARA Reviews

| Number | Title |
|---|---|
| 15-0321 | Primary Resin Activities |
| 15-10120 | At Power Reactor Building Entries |

ALARA Reviews

| Number | Title |
|---|---|
| 15-5322ISFSI | Dry Cask Storage Campaign 2015 |
| R20-55220-NEW-RVCH | Refuel 20 Head Replacement |
| R20-BB-8948A | Refuel 20 Work on Valve BB8948A |

Miscellaneous Documents

| Title | Revision |
|---|---|
| Callaway Energy Center Long Range Dose And Source Term Reduction Plan | 6 |

**Section 4OA1: Performance Indicator Verification**

Callaway Action Requests

201501853 201505319

Miscellaneous

| Title | Revision Date |
|---|---|
| MSPI Basis Document | 15 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unavailability Index | December 2014 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unreliability Index | December 2014 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unavailability Index | March 2015 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unreliability Index | March 2015 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unavailability Index | June 2015 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unreliability Index | June 2015 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unavailability Index | September 2015 |
| MSPI Derivation Report, MSPI High Pressure Injection System, Unreliability Index | September 2015 |
| NRC Performance Indicator Transmittal Report, Fourth Quarter 2014, Mitigating Systems Cornerstone | January 6, 2015 |

Miscellaneous

| Title | Revision Date |
|---|---|
| NRC Performance Indicator Transmittal Report, First Quarter 2015, Mitigating Systems Cornerstone | April 20, 2015 |
| NRC Performance Indicator Transmittal Report, Second Quarter 2015, Mitigating Systems Cornerstone | July 8, 2015 |
| NRC Performance Indicator Transmittal Report, Third Quarter 2015, Mitigating Systems Cornerstone | October 12, 2015 |

**Section 4OA2: Identification and Resolution of Problems**

Procedures

| Number | Title | Revision Date |
|---|---|---|
| APA-ZZ-00500 | Corrective Action Program | 62 |
| APA-ZZ-00330 | Preventative Maintenance Program | 44 |
| APA-ZZ-00549 | Equipment Reliability Improvement Program | 14 |
| APA-ZZ-00549 Appendix E | Unit | |
| EDP-ZZ-01131 Appendix H | Health Issue Development | 6 |
| EDP-ZZ-01135 | Preventative Maintenance Optimization Evaluations | 13 |

Callaway Action Requests

| | | | | |
|---|---|---|---|---|
| 200803108 | 201206475 | 201500737 | 201506172 | 201506340 |

Miscellaneous

| Number | Title | Date |
|---|---|---|
| | Trend CARS from 2015/06/01 to 2015/12/01 | December 3, 2015 |
| | First Performance Date Evaluation of Main Turbine Mark II EHC Circuit Boards | December 21, 2015 |

**Section 4OA3: Event Follow-Up**

Procedures

| Number | Title | Revision |
|---|---|---|
| OTN-BB-00001 | Reactor Coolant System – IPTE | 37, 38 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22EP01 (Q) | Accumulator Safety Injection Piping and Instrumentation Diagram | 18 |

Callaway Action Requests

201400240 201408530

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| LER 2014-002-00 | Licensee Event Report: Operation Outside of Pressure and Temperature Limits Report Curve Required by Technical Specification 3.4.3 | 0 |
| Curve Book Figure 14.9 | Callaway Plant Pressure and Temperature Limits Report | 6 |
| LER 2014-003-02 | Inverter NN11 Inadvertently Transferred to its Alternate AC Source | 2 |
| LER 2014-005-00 | All ECCS Accumulator Isolation Valve Operator Breakers Closed in Mode 3 with RCS Pressure Greater than 1000 PSIG | 0 |
| LER 2014-005-01 | All ECCS Accumulator Isolation Valve Operator Breakers Closed in Mode 3 with RCS Pressure Greater than 1000 PSIG | 1 |

**The following items are requested for the**
**Occupational Radiation Safety Inspection**
**at Callaway**
**(October 26 – 30, 2015)**
**Integrated Report 2015003**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **October 6, 2015**.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact the lead inspector, John O'Donnell at (817) 200-1441 or John.ODonnell@nrc.gov.

Currently, the other inspector will be Pete Hernandez [(817) 200-1168 or Pete.Hernandez@nrc.gov].

**PAPERWORK REDUCTION ACT STATEMENT**

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

**1. Radiological Hazard Assessment and Exposure Controls (71124.01)**
Date of Last Inspection: **October 27, 2014**

A. List of contacts (with official title) and telephone numbers for the Radiation Protection Organization Staff and Technicians

B. Applicable organization charts

C. Audits, self-assessments, and LERs written since date of last inspection, related to this inspection area

D. Procedure indexes for the radiation protection procedures

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
1. Radiation Protection Program Description
2. Radiation Protection Conduct of Operations
3. Personnel Dosimetry Program
4. Posting of Radiological Areas
5. High Radiation Area Controls
6. RCA Access Controls and Radworker Instructions
7. Conduct of Radiological Surveys
8. Radioactive Source Inventory and Control
9. Declared Pregnant Worker Program

F. List of corrective action documents (including corporate and subtiered systems) since date of last inspection
a. Initiated by the radiation protection organization
b. Assigned to the radiation protection organization
c. Identify any CRs that are potentially related to a performance indicator event

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable" so that the inspector can perform word searches.

If not covered above, a summary of corrective action documents since date of last inspection involving unmonitored releases, unplanned releases, or releases in which any dose limit or administrative dose limit was exceeded (for Public Radiation Safety Performance Indicator verification in accordance with IP 71151)

G. List of radiologically significant work activities scheduled to be conducted during the inspection period (If the inspection is scheduled during an outage, please also include a list of work activities greater than 1 rem, scheduled during the outage with the dose estimate for the work activity.)

H. List of active radiation work permits

I. Radioactive source inventory list

**2. Occupational ALARA Planning and Controls (71124.02)**
Date of Last Inspection: **August 25, 2014**

A. List of contacts (with official title) and telephone numbers for ALARA program personnel

B. Applicable organization charts

C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA

D. Procedure index for ALARA Program

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
1. ALARA Program
2. ALARA Committee
3. Radiation Work Permit Preparation

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates.

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable."

G. List of work activities greater than 1 rem, since date of last inspection. Include original dose estimate and actual dose.

H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)

I. Outline of source term reduction strategy