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

February 4, 2015

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 05000483/2014005

Dear Mr. Diya,

On December 31, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. On January 7, 2015, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. Further, inspectors documented two licensee-identified violations which were determined to be of very low safety significance in this report. 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

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Sincerely,

/RA/

Neil O'Keefe, Branch Chief
Project Branch B
Division of Reactor Projects

Docket Number: 50-483
License Number: NPF-30

Enclosure:
Inspection Report 05000483/2014005
w/ Attachments:
1. Supplemental Information
2. Items Requested for the Occupational Radiation Safety Inspection at Callaway Plant, October 27-31, 2014
3. Notification of Inspection and Request for Information, January 22, 2014

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Letter to F. Diya from N. O'Keefe, dated February 4, 2015

SUBJECT: CALLAWAY PLANT – NRC INEGRATED INSPECTION REPORT 05000483/2014005

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000483
License:	NPF-30
Report:	05000483/2014005
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Steedman, MO
Dates:	September 20 through December 31, 2014
Inspectors:	T. Hartman, Senior Resident Inspector Z. Hollcraft, Resident Inspector I. Anchondo, Reactor Inspector L. Brandt, Project Engineer J. Buchanan, Physical Security Inspector P. Elkmann, Senior Emergency Preparedness Inspector M. Langelier, Project Engineer J. O'Donnell, Health Physicist L. Ricketson, P.E., Senior Health Physicist W. Sifre, Senior Reactor Inspector C. Stott, Project Engineer F. Thomas, Project Engineer
Approved By:	N. O'Keefe Chief, Project Branch B Division of Reactor Projects

SUMMARY

IR 05000483/2014005; 09/20/2014 – 12/31/2014; Callaway Plant, Integrated Resident and Regional Report; Maintenance Effectiveness and Reactor Vessel Head Replacement.

The inspection activities described in this report were performed between September 20 and December 31, 2014, by the resident inspectors at the Callaway Plant and inspectors from the NRC's Region IV office. One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. Additionally, NRC inspectors documented two licensee-identified violations of very low safety significance. 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. NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

Green. Inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," involving the licensee's failure to correct a condition adverse to quality. Specifically, an extent of condition review for a failed gasket identified that other safety related gaskets installed in the plant were potentially less reliable; however, no action was taken. One of these gaskets failed on October 17, 2014, and caused a 52 gpm leak from the end bell of the train B control room air conditioning chiller affecting the reliability of the train. This issue was entered into the licensee's corrective action program as Callaway Action Request 201409335. One remaining improperly installed gasket was evaluated and operability was justified.

The inspectors determined the failure to correct a condition adverse to quality was a performance deficiency. This performance deficiency was more than minor because it was associated with and adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, during the period of November 2013 to October 2014, the failure to correct an improperly installed gasket on a control room air conditioning unit resulted in reduced reliability of the safety related system. Using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance (Green) because it did not affect the design or qualification of the system, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non-technical specification trains of equipment designated as high safety-significance. The finding has an Evaluation cross-cutting aspect within the problem identification and resolution area because the licensee failed to thoroughly evaluate and ensure that the resolution addressed the extent of condition commensurate with its safety significance. Specifically, the extent of condition for improperly installed safety related gaskets was identified; however, the evaluation of the degraded condition did not assess the significance and cause corrective actions to be scheduled in a timely manner commensurate with that significance [P.2]. (Section 1R12)

Licensee-Identified Violations

Two violations of very low safety significance were identified by the licensee and have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

PLANT STATUS

Callaway began the inspection period at 100 percent power. On October 6, 2014, the licensee began coasting down at the end of the operating cycle and on October 11 the licensee shut the plant down to start Refueling Outage 20. The reactor was restarted on November 21 and the plant was returned to full power on November 26. On December 3 the plant tripped due to an electrical fault experienced on the excitation transformer of the main generator. Callaway remained shutdown until December 5 when the reactor was restarted. The plant returned to 100 percent power on December 7. Callaway operated at full power for the remainder of the inspection period.

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

a. Inspection Scope

On November 14, 2014, 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 winter readiness and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of cold weather and snow; the licensee had corrected weather-related equipment deficiencies identified during the previous winter.

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

- refueling water storage tank
- condensate storage tank

The inspectors reviewed the licensee's procedures and design information to ensure the systems or components 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 adverse 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

Since high wind conditions were forecast in the vicinity of the facility for October 1, 2014, 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)

.1 Partial Walkdown

a. Inspection Scope

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

- October 30, 2014, train A spent fuel pool cooling
- November 4, 2014, train A emergency diesel generator air start system
- November 19, 2014, train B motor-driven auxiliary feedwater 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 three partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On November 11, 2014, the inspectors performed a complete system walk-down inspection of the cold overpressure mitigation system. The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, completed work orders, open condition reports, and other open items tracked by the

licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, 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:

- October 8, 2014, auxiliary building level 2047, area A-19
- November 17, 2014, reactor building, area RB-1
- December 23, 2014, train A safety injection and centrifugal charging pumps, area A-2
- December 30, 2014, auxiliary shutdown panel, areas A-28 and A-33

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

On December 23, 2014, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. 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:

- Train A and B emergency core cooling system pump rooms

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.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

The activities described in subsections 1 through 4 below constitute completion of one inservice inspection sample, as defined in Inspection Procedure 71111.08.

.1 Non-destructive Examination Activities and Welding Activities

a. Inspection Scope

The inspectors directly observed the following non-destructive examinations:

System	Weld Identification	Examination Type
Feedwater	2AE05F021	Ultrasonic
Steam Generator A Main Steam Isolation Valve	ABHV0014	Ultrasonic
Pressurizer Skirt Weld	2-TBB03-SKIRT-W-IWA	Magnetic Particle
Steam Generator A Main Steam Isolation Valve	ABHV0014	Phased Array Ultrasonic
Pressurizer Spray Nozzle Weld Overlay	2-TBB03-SPR-07000267-SWOL	Phased Array Ultrasonic
Pressurizer Relief Nozzle Weld Overlay	2-TBB03-REL-07000264-SWOL	Phased Array Ultrasonic

The inspectors reviewed records for the following non-destructive examinations:

System	Weld Identification	Examination Type
Chemical and Volume Control	2-BG-02-H009	Visual (VT-3)

System	Weld Identification	Examination Type
Reactor Vessel Inlet Nozzle Safe End Weld	2-RV-302-121-A	Ultrasonic, Eddy Current
Reactor Vessel Inlet Nozzle Safe End Weld	2-RV-302-121-B	Ultrasonic, Eddy Current
Reactor Vessel Inlet Nozzle Safe End Weld	2-RV-302-121-B	Ultrasonic, Eddy Current
Reactor Vessel Inlet Nozzle Safe End Weld	2-RV-302-121-B	Ultrasonic, Eddy Current

During the review and observation of each examination, the inspectors observed whether activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspectors also reviewed the qualifications of all non-destructive examination technicians performing the inspections to determine whether they were current.

The inspectors reviewed records for the following welding activities:

System	Weld Identification	Weld Type	Examination Type
Auxiliary Feedwater	13004618/500	Gas Tungsten Arc Weld	Magnetic Particle, Liquid Penetrant
Residual Heat Removal	13004624/010	Gas Tungsten Arc Weld	Liquid Penetrant, Radiography
High Pressure Coolant Injection	13004626/010	Gas Tungsten Arc Weld	Radiography
Essential Service Water	14003510/407	Gas Tungsten Arc Weld	Magnetic Particle

The inspectors reviewed whether the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code Section IX requirements. The inspectors also determined whether essential variables were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

The licensee replaced the reactor vessel upper head. All inspection activities associated with the upper head replacement are documented in Section 4OA5. Therefore, the inspectors determined this section of Inspection Procedure 71111.08 was not applicable.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's implementation of its boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walk-down as specified in Procedure EDP-ZZ-01004, "Boric Acid Corrosion Control Program," Revision 17, and Procedure QCP-ZZ-05048, "Boric Acid Walkdown for (Reactor Coolant System) RCS Pressure Boundary," Revision 8. The inspectors reviewed whether the visual inspections emphasized locations where boric acid leaks could cause degradation of safety-significant components, and whether evaluations used corrosion rates applicable to the affected components and properly assessed the effects of corrosion-induced wastage on structural or pressure boundary integrity. The inspectors observed whether corrective actions taken were consistent with the ASME Code, and 10 CFR Part 50, Appendix B requirements.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

The licensee did not perform inspections of the steam generator tubes. No inspections were required this outage. No primary side inspections were performed. Therefore, the inspectors determined this section of Inspection Procedure 71111.08 was not applicable.

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 7, 2014, the inspectors observed the plant startup simulator training for 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

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 or risk. The inspectors observed the operators' performance of the following activities:

- September 24, 2014, train B emergency diesel generator 24-hour run
- October 11, 2014, plant shut down for refueling

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 two instances of degraded performance or condition of safety-related structures, systems, and components:

- September 13, 2014, train A emergency diesel generator jacket water leak
- October 17, 2014, train B control room air conditioning unit gasket failure

The inspectors reviewed the extent of condition of possible common cause structures, systems, and 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

Introduction. The inspectors reviewed a Green 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 identified in safety related equipment installed in the plant. Specifically, following a failure of a gasket in 2013, the licensee identified that other safety related gaskets installed in the plant were installed incorrectly; however, no action was taken to correct this condition. As a result, during system testing, the train B control room air conditioning chiller unit's inlet end bell gasket extruded resulting in excess leakage.

Description. On October 17, 2014, during the performance of train B engineered safety feature actuation system testing, a pressure transient caused by a pump start resulted in a leak on train B of the control room air conditioning system chiller end bell gasket. This leak was quantified as approximately 52 gallons per minute. The unit was isolated and Technical Specification 3.7.11, Condition A, was entered while repairs were completed. It was restored to an operable condition within the time allowed by the technical specification action statement following replacement of the gasket.

The pressure transient exhibited during the testing was determined to be higher than normal system pressure due to the system alignment, but was still within design pressure and not significantly different than that which would be expected during an actual system actuation. As a result, the licensee reviewed the maintenance history of the unit and determined that gasket leakage had occurred on five occasions on this and similar units, dating back to 2007, during or soon after post-maintenance testing. This particular gasket had been installed under Preventative Maintenance Work Instruction 13511041 in August 2013.

In November 2013, after a failure of train B safety related switchgear chiller, a similar unit to the control room air conditioning chiller, Callaway Action Request 201308726 documented that the bolts fastening the chiller end bells were being torqued to 80 ft.-lbs.; however, this value appears to have no known technical basis. After researching the required compressive stress for the type of gaskets being used for these end bells, the licensee calculated that a torque value of 35 ft.-lbs should be used and changed their maintenance procedures to reflect this new value.

In February 2014, train A of the control room air conditioning system also experienced gasket leakage approximately six days after it had been replaced and torqued using the new specification of 35 ft.-lbs. After reviewing the skill of the craft versus the specificity

of the work instructions, it was determined that extra procedural enhancements should be added to provide guidance on bolt tightening, use of lubricant, and prevention of contamination during the installation process. These were added to the corrective actions already developed for Callaway Action Request 201308726.

The licensee concluded that excessive bolting torque combined with inadequate skill of the craft and maintenance procedures on the part of the electrical maintenance technicians was leading to gasket unreliability and failures. After each of these instances of gasket failure, an extent of condition evaluation was completed that identified that this condition could exist in two safety related air conditioning units and two units that are important to safety. However, no immediate corrective actions or evaluations of whether the improperly installed gaskets constituted a degraded condition occurred. It was not until the pressure transient experienced during the testing in October 2014 that one of these susceptible gaskets failed during operation. The condition of the remaining improperly installed gasket was evaluated and operability justified in Callaway Action Request 201409335.

The licensee evaluated the impact of the gasket leak experienced on October 17, 2014, on the operability of the control room air conditioning system and the essential service water system. This evaluation concluded that the amount of leakage from the extruded gasket would not have threatened operability of the essential service water system. The amount of flow to the air conditioning unit also had enough margin to justify that it would have been able to perform its safety related function during an accident scenario. Based on this evaluation, the unit was deemed to have been operable but degraded during the period from August 2013 to October 2014.

Analysis. The failure to correct a condition adverse to quality, identified in the plant, was a performance deficiency. Title 10 of the *Code of Federal Regulations*, Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that conditions adverse to quality are promptly identified and corrected. The licensee identified that the improperly installed safety related gaskets were subject to an increased failure rate, but failed to evaluate the impact or take prompt action to correct the condition. This performance deficiency is more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, during the period of November 2013 to October 2014, the failure to correct an improperly installed gasket on a control room air conditioning chiller unit resulted in reduced reliability of the safety related train. Using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance because it did not affect system design, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non-technical specification trains of equipment designated as high safety-significance.

This finding has an Evaluation cross-cutting aspect within the problem identification and resolution cross-cutting area because the licensee failed to thoroughly evaluate this issue to ensure that the resolution addressed the extent of condition commensurate with its safety significance. Specifically, the extent of condition was identified; however, no evaluation of the significance of the degraded condition was performed [P.2].

Enforcement. Title 10 of the *Code of Federal Regulations*, Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that conditions adverse to quality, such as deficiencies, are promptly identified and corrected. Contrary to the above, from November 13, 2013, to October 17, 2014, the licensee failed to correct a condition adverse to quality. Specifically, Callaway Plant failed to take action to correct installed safety related gaskets in two safety related air conditioning system chillers that had been identified to have been improperly installed and were subject to failure, which constituted a condition adverse to quality. The licensee replaced the ruptured gasket and performed a new extent of condition evaluation for the remaining potentially improperly installed gasket. Because this violation was determined to be of very low safety significance (Green) and was entered into the licensee's corrective action program as Callaway Action Request 201409335, this violation is being treated as a non-cited violation in accordance with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014005-01, "Failure to Correct a Condition Adverse to Quality on Safety Related Equipment."

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

a. Inspection Scope

The inspectors reviewed three 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:

- October 21, 2014, yellow shutdown risk due to low reactor coolant system inventory
- October 27, 2014, yellow shutdown risk due to only one train of spent fuel pool cooling available

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.

Additionally, on October 29, 2014, the inspectors observed portions of one emergent work activity that had the potential to impact barrier integrity; a vendor crane malfunctioned with the old reactor vessel head suspended from the crane, Job 13004893.

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected structures, systems, and components.

These activities constitute completion of three maintenance risk assessment 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 that the licensee performed for degraded or nonconforming structures, systems, or components:

- October 21, 2014, operability determination of residual heat removal system due to high vibrations on a vent pipe, Callaway Action Request 201407283
- October 22, 2014, operability determination of train B emergency diesel generator due to high vibrations on the train B essential service water pump, Callaway Action Request 201407444
- November 3, 2014, operability determination of train B emergency diesel generator intercooler due to the space bar having one missing locknut and one loose locknut, Callaway Action Request 201407779

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, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded structures, systems, and 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.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- November 6, 2014, train B essential service water piping replacement, Job 14003781
- November 6, 2014, train B emergency diesel generator maintenance outage, Job 13505272
- December 1, 2014, letdown system socket weld leak repair, Job 14006129

- December 4, 2014, motor-driven auxiliary feedwater pump flow control valve to steam generator D repairs, Job 14006195

The inspectors reviewed licensing- and design-basis documents for the structures, systems, 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 structures, systems, and components.

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

During the station's refueling outage that concluded on November 22, 2014, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan prior to the outage
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities
- Observation and review of reduced-inventory activities
- Observation and review of fuel handling activities
- Monitoring of heat-up and startup activities

These activities constitute completion of one refueling outage sample, as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

.2 Other Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for an unplanned outage that began on December 3, 2014, and continued through December 6. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule. The inspectors also confirmed that the licensee

scheduled covered workers such that the minimum days off for individuals working on outage activities were in compliance with 10 CFR 26.205(d)(4) and (5).

The outage was caused when a ground occurred in the main generator exciter transformer. This caused a lockout of the main generator that opened both of the main generator output breakers, which resulted in a trip of the main turbine and an automatic trip of the reactor.

During the outage, the inspectors observed portions of the shutdown and monitored licensee controls over the outage activities listed below.

- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing
- Status and configuration of systems to ensure that technical specifications were met
- Management of fatigue
- Licensee identification and resolution of problems related to outage activities
- Startup and ascension to full power operation and tracking of startup prerequisites

These activities constitute completion of one outage activities sample, as defined in Inspection Procedure 71111.20.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed eight 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:

In-service tests:

- November 25, 2014, train A safety injection pump and valve testing, Job 14508849

Reactor coolant system leak detection tests:

- November 29, 2014, reactor coolant system inventory balance

Other surveillance tests:

- September 24, 2014, train B emergency diesel generator 24-hour run, Job 13503949
- October 8, 2014, simultaneous start of both emergency diesel generators, Job 08502992

- October 11, 2014, main turbine overspeed testing, Job 13506675
- October 14, 2014, containment integrated leak rate test, Job 04501245
- October 17, 2014, train A and B engineered safety features actuation system testing, Job 13506547
- November 21, 2014, low power physics testing, Job 13508126

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. The inspectors verified that the licensee restored the operability of the affected structures, systems, and components following testing.

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

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an in-office review of the "Callaway Plant Radiological Emergency Response Plan," Revision 45, and Procedure EIP-ZZ-00212, "Protective Action Recommendations," Revision 26. These revisions,

- Changed the description of the licensee's dose assessment model from a straight-line Gaussian to a variable trajectory model
- Deleted evacuation time estimates from Procedure EIP-ZZ-00212
- Deleted MAGNEM as the licensee's primary method of radiological assessment
- Implemented the Unified RASCAL dose assessment program as the licensee's primary method of radiological assessment

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q)(3) and 50.54(q)(4). The inspectors verified that the revisions did not decrease the effectiveness of the emergency plan. This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of two emergency action level and emergency plan changes samples as defined in Inspection Procedure 71114.04.

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, and 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.

2RS3 In-plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

The inspectors evaluated whether the licensee controlled in-plant airborne radioactivity concentrations consistent with ALARA principles and that the use of respiratory protection devices did not pose an undue risk to the wearer. During the inspection, the inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- The licensee's use, when applicable, of ventilation systems as part of its engineering controls
- The licensee's respiratory protection program for use, storage, maintenance, and quality assurance of National Institute for Occupational Safety and Health-certified equipment, qualification and training of personnel, and user performance
- The licensee's capability for refilling and transporting self-contained breathing apparatus air bottles to and from the control room and operations support center during emergency conditions, status of self-contained breathing apparatus staged and ready for use in the plant and associated surveillance records, and personnel qualification and training
- Audits, self-assessments, and corrective action documents related to in-plant airborne radioactivity control and mitigation since the last inspection

These activities constitute completion of one sample of in-plant airborne radioactivity control and mitigation as defined in Inspection Procedure 71124.03.

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 2013 through third quarter 2014 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 2013 through third quarter 2014 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 and or losses of radiological control over locked high radiation areas and very high radiation areas during the period of second quarter 2013 through third quarter 2014. 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 from second quarter 2013 through third quarter 2014, 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 specification/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

The inspectors reviewed the licensee's corrective action program, performance indicators, system health reports, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors verified that the licensee was taking corrective actions to address identified adverse trends.

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

b. Observations and Assessments

The inspectors noted the following negative trends: an increasing number of missed or late hourly fire watch checks and inconsistent use of written instructions by the maintenance department. The inspectors verified that the licensee was aware of these issues and these issues have been entered into the corrective action program.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

On November 18, 2014, the inspectors selected Callaway Action Request 201408530, which identified that, contrary to technical specifications, multiple safety injection accumulator outlet valve breakers were closed at the same time, 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 and prevent recurrence. A licensee-identified violation associated with this issue is described in Section 4OA7.

The inspectors also assessed the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the operator workarounds on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents.

The inspectors performed a review of the cumulative effects of operator workarounds. The documents listed in the attachment were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their corrective action program, and proposed or implemented appropriate and timely corrective actions that addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an initiating event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the

potential for inappropriate compensatory actions. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workarounds.

These activities constitute completion of two annual follow-up samples, which included one operator work-around sample, as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

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

On December 3, 2014, at 12:33 a.m., the Callaway plant tripped. A cable located inside the main generator exciter transformer shorted against the core of the transformer. This caused the main generator lockout relays to actuate and the immediate opening of the two output breakers that transmit the electricity from the main generator to the grid. Protective relays caused the main turbine to trip offline and the reactor to shut down as designed.

The NRC resident inspectors responded to the plant to review plant status, communicate the event to supervision, evaluate performance of operators and mitigating systems, and ensure proper licensee actions and evaluation of event classifications.

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

4OA5 Other Activities

Reactor Vessel Head Replacement

a. Inspection Scope

1. Design and Planning Inspections

The inspectors used the guidance in Inspection Procedure 71007, “Reactor Vessel Head Replacement Inspection,” to perform the following reactor vessel head design and planning inspection activities.

Engineering and Technical Support

The inspectors reviewed engineering and technical support activities performed prior to, and during, the reactor vessel head replacement outage. This review verified that selected design changes and modifications to structures, systems, and components described in the Final Safety Analysis Report for transporting the new and old reactor vessel heads were reviewed in accordance with 10 CFR 50.59. Additionally, key design aspects and modifications associated with the reactor vessel head replacement were also reviewed.

Lifting and Rigging

The inspectors reviewed engineering design, modification, and analysis associated with reactor vessel head lifting and rigging activities. This included: (1) crane and rigging equipment; (2) reactor vessel head component drop analysis; (3) safe load paths; and (4) load laydown areas.

Radiation Protection

The inspectors reviewed radiation protection program controls, planning, and preparation in: (1) as low as is reasonably achievable (ALARA) planning; (2) dose estimates and tracking; (3) exposure and contamination controls; (4) radioactive material management; (5) radiological work plans and controls; (6) emergency contingencies; and (7) project staffing and training plans. This review was performed in conjunction with the baseline inspections conducted during Refueling Outage 20.

Security Considerations

The inspectors observed security controls and reviewed security plans to verify that any potential adverse impacts were minimized. The inspectors made frequent observations of security actions to verify that the licensee had implemented the appropriate controls for affected vital and protected area barriers during the reactor head replacement activities.

2. Reactor Vessel Head Fabrication Inspections at Licensee Facility

The inspectors used the guidance in Inspection Procedure 71007, “Reactor Vessel Head Replacement Inspection,” to perform the following reactor vessel head fabrication inspection activities.

Heat Treatment

The inspectors verified that the material heat treatment used to enhance the mechanical properties of the reactor vessel head material carbon, low alloy, and high alloy chromium steels was conducted per ASME code and approved vendor procedures consistent with the applicable ASME Code, Section III, requirements. Also, the inspectors reviewed the heat treatment procedures to assure that requirements associated with the following areas were met: (1) furnace atmosphere; (2) furnace temperature distribution and calibration of measuring and recording devices; (3) thermocouple installation; (4) heating and cooling rates; (5) quenching methods; and (6) record and documentation requirements.

Nondestructive Examination (NDE)

Inspections were conducted to ensure the manufacturing control plan included provisions for monitoring NDE to ascertain that the NDE was performed in accordance with applicable code, material specification, and contract requirements.

Welding

The inspectors reviewed the documentation for the weld overlay welding operations that established a layer of stainless steel cladding on the inside of the reactor vessel head to

determine if it was accomplished per design. The inspectors also selected a sample of control rod drive mechanism flange-to-nozzle welds and reviewed the following items: (1) certified mill test reports of the flange, weld material rods, and control rod drive mechanism nozzles; (2) certified mill test reports for the welding material for the reactor vessel head cladding; (3) cladding weld records, weld rod material control requisitions, traceability of weld material rods, weld procedure qualification, welder qualifications, and nonconformance reports; (4) control rod drive mechanism nozzle cladding welding inspection records, weld rod material control requisitions, traceability of weld material rods, weld procedure qualification, welder qualifications, and nonconformance reports; (5) control rod drive mechanism to nozzle welding and welds inspection records, weld rod material control requisitions, traceability of weld material rods, weld procedure qualification, welder qualifications, and nonconformance reports; and (6) NDE procedures, NDE records of the welds, NDE personnel qualifications, and certification of the NDE solvents.

Procedures

Inspectors verified that repair procedures had been established and that these procedures were consistent with applicable ASME code, material specification, and contract requirements by verifying: (1) repair welding was conducted in accordance with procedures qualified to Section IX of the ASME code; (2) all welders had been qualified in accordance with Section IX of the ASME code; (3) records of repairs were maintained; and (4) that requirements had been established for the preparation of certified material test reports and that the records of all required examinations and tests were traceable to the procedures to which they were performed.

Code Reconciliation

The inspectors reviewed the required documentation, supplemental examinations, analysis, and ASME code documentation reconciliation to ensure that the original ASME code N-Stamp remains valid, and that the replacement head complies with appropriate NRC rules and industry requirements. The inspectors also ensured that the design specification was reconciled and a design report was prepared for the reconciliation of the replacement head, verifying that they were certified by professional engineers competent in ASME code requirements.

Quality Assurance Program

The inspectors verified that: (1) machining was carried out under a controlled system of operation; (2) a drawing/document control system was in use in the manufacturing process; and (3) part identification and traceability was maintained throughout processing and was consistent with the manufacturer's quality assurance program.

Compliance Inspection

The inspectors verified that the original ASME Code, Section III, data packages for the replacement reactor vessel head were supplemented by documents included in the ASME Code, Section XI, (pre-service inspection) data packages. The inspectors examined selected manufacturing and inspection records of the finished machined reactor vessel head and verified compliance with applicable documentation requirements.

3. Reactor Vessel Head Removal and Replacement Inspections

The inspectors used the guidance in Inspection Procedure 71007, "Reactor Vessel Head Replacement Inspection," to perform the following reactor vessel head removal and replacement inspection activities:

Lifting and Rigging

The inspectors reviewed preparations and procedures for rigging and heavy lifting including crane and rigging inspections, testing, equipment modifications, laydown area preparations, and training for the following activities:

- Area preparation for the outside systems
- Lattice boom crawler crane assembly, disassembly, and operation
- Hydraulic gantry lift system
- Outside bridge and trolley transfer system
- Elevated cantilevered handling device installation and use
- Reactor vessel head lift rig and polar crane
- Downender/upender fixture
- Old reactor vessel head removal
- New reactor vessel head placement
- Transport of old reactor vessel head to storage location

Major Structural Modifications

The inspectors reviewed and observed portions of the one structural modification made to facilitate reactor vessel head replacement. Specifically, the inspectors reviewed the engineering documents associated with the removal of a portion of wall in containment. The change in design of the reactor head package made the portion of wall removed from containment unnecessary. The inspectors reviewed the design change associated with this modification.

Containment Access and Integrity

The inspectors observed there were no modifications to the existing containment access structure or integrity to allow for the reactor vessel head to be removed and installed. The new and old reactor vessel head were moved in and out of containment using the existing equipment hatch.

Outage Operating Conditions

The inspectors reviewed and observed the establishment of operating conditions including: (1) defueling; (2) reactor coolant system draindown; (3) system isolation; (4) safety tagging; (5) radiation protection controls; (6) controls for excluding foreign materials in the reactor vessel; (7) verification of the suitability of reinstalled (reused) components for use; and (8) the installation, use, and removal of temporary services. Section 1R20 of this report documents additional activities that were performed during the outage.

Storage of Removed Reactor Vessel Head

The inspectors reviewed the radiological safety plans and observed the transport, storage, and radiological surveys of the old reactor vessel head to its onsite storage location. The inspectors assessed licensee performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable with respect to the reactor vessel head replacement. During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- ALARA work activity plans and evaluations, in-progress reviews, exposure estimates, and exposure mitigation requirements
- Radiation worker and radiation protection technician performance during work activities in radiation areas and high radiation areas

4. Reactor Vessel Head Post Installation Verification and Testing Inspections

The inspectors used the guidance in Inspection Procedure 71007, "Reactor Vessel Head Replacement Inspection," to perform the following post-installation verification and testing inspection activities. Selective inspections were performed of the following areas: (1) containment testing; (2) licensee's post-installation inspections and verifications program and its implementation; (3) reactor coolant system leakage testing and review of test results; (4) procedures required for equipment performance testing to confirm the design and to establish baseline measurements; and (5) pre-service inspection of new welds.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 31, 2014, the inspectors presented the radiation safety inspection results to Mr. D. Neterer, Vice President, 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 November 20, 2014, the inspectors presented the inservice inspection results to Ms. S. Banker, Senior Director of Executive Projects, 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 November 20, 2014, the inspectors presented the reactor vessel head inspection results to Ms. S. Banker, Senior Director of Executive Projects, 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 5, 2014, the inspectors conducted a telephonic exit meeting to present the results of the in-office inspection of changes to the licensee's emergency plan to Mr. P. McKenna,

Manager, Emergency Preparedness, 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 7, 2015, the resident inspectors presented the inspection results to Mr. F. Diya, Senior Vice President and Chief Nuclear Officer, 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.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as non-cited violations.

- Title 10 of the *Code of Federal Regulations*, Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, and drawings. Attachment 3 of Callaway Procedure APA-ZZ-01400, Appendix K, "Tools for Event Prevention," is a procedure that affects quality. It states that workers shall identify conditions on a jobsite such as sensitive equipment in the work area, and continues on to state the worker needs to eliminate hazards, install appropriate barriers, or develop contingencies before proceeding with the task. Contrary to the above, on September 12, 2014, the licensee failed to accomplish an activity affecting quality in accordance with procedures. Specifically, maintenance technicians failed to follow Procedure APA-ZZ-01400, Appendix K, and identify that train A emergency diesel generator jacket water heater outlet relief valve was sensitive equipment in that it was a valve that could be accidentally repositioned if working in the area. As a result, they failed to protect the valve from inadvertent operation. During maintenance, the valve was bumped out of position during maintenance work, causing the jacket water system to slowly leak and rendered the diesel inoperable for approximately 25 hours before being identified by operations personnel. Using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance because it did not affect the design of the system, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non-technical specification trains of equipment designated as high safety-significance. This violation was entered into the licensee's corrective action program as Callaway Action Request 201406128.

- Technical Specification 5.4.1.a states, in part, that "written procedures shall be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, Appendix A, February 1978."

  NRC Regulatory Guide 1.33, Appendix A, Section 1.d. requires procedures for "Procedure Adherence and Temporary Change Method."

Procedure APA-ZZ-00100, “Written Instructions Use and Adherence,” Revision 32, a procedure intended to meet the above requirements, Section 4.1, “Rules for Written Instructions,” states in part,

> 4.1.8. Perform procedures or written instructions in the following manner:
>
> - Numbered or lettered steps are performed in sequence
>
> 4.1.9. Sections of a procedure or work instruction may be performed “out of sequence” or concurrently if allowed by the document. Steps within a section MUST be performed in the order written.

Additionally, for procedures identified as Continuous Use, it states in part, “4.6.2.c. Perform the step as written in the sequence specified.”

Contrary to the above, on November 18, 2014, the licensee failed to implement a procedure required by Technical Specification 5.4.1.a. Specifically, a licensed operator failed to comply with Sections 4.1 and 4.6 of Procedure APA-ZZ-00100 when he entered multiple sections of Procedure OSP-BB-VL006, “RCS Pressure Isolation Valves Inservice Tests – IPTE,” which was not allowed by the document. The operator directed the closing of the breakers for all four safety injection accumulator isolation valves at the same time when the procedure directed testing one valve at a time and restoring after each test.

Using NRC Inspection Manual 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” the finding was determined to be of very low safety significance because it did not affect the design or qualification of a system, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non-technical specification trains of equipment designated as high safety-significance. This violation was entered into the licensee’s corrective action program as Callaway Action Request 201408530.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

S. Abel, Director, Engineering Projects
S. Banker, Senior Director, Executive Projects
F. Bianco, Assistant Operations Manager, Shift
R. Davis, Welding Engineer, Nuclear Engineering
F. Diya, Senior Vice President and Chief Nuclear Officer
J. Doughty, ISI Program Owner
G. Forster, NDE Level III
K. Gilliam, Supervisor, Radiation Protection
C. Graham II, Health Physicist, Radiation Protection
J. Heithold, Career Engineer, Major Modifications
A. King, Health Physicist, Radiation Protection
J. Kovar, Licensing Engineer
G. Kremer, Director, Engineering Programs
P. McKenna, Manager, Emergency Preparedness
V. Miller, Supervising Health Physicist, Radiation Protection
W. Moskopf, Project Manager, Replacement Reactor Vessel Closure Head
D. Neterer, Vice President, Nuclear Operations
J. Nurrenbern, Boric Acid Corrosion Control Program Manager
S. Petzel, Licensing Engineer, Regulatory Affairs
C. Smith, Manager, Radiation Protection
D. Thompson, Health Physicist, Radiation Protection
R. Wilson, Engineer, Snubbers and Supports
T. Witt, Licensing Engineer, Regulatory Affairs

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2014005-01	NCV	Failure to Correct a Condition Adverse to Quality on Safety Related Equipment (Section 1R12)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
OTO-ZZ-00007, Attachment 3	Outside Operator Cold Weather Preparation	28
OTO-ZZ-00012	Severe Weather	29

Procedures

Number	Title	Revision
OTS-ZZ-00007	Plant Cold Weather	29

Callaway Action Requests

201407653

Jobs

13513839	14004720	14004781	14005404	

Miscellaneous

Title	Date
Jobs Coded for Winter	November 10, 2014
Cold Weather Preparations for 2014	November 10, 2014

Section 1R04: Equipment Alignment

Procedures

Number	Title	Revision
OSP-AL-V001A, Checklist 1	Train A Auxiliary Feedwater Valve Inservice Test, Auxiliary Feedwater System Restoration	32
OSP-KJ-V002A	A Diesel Air Start System Restoration	7

Callaway Action Requests

201103532	201407507	201407658	201407746	201407893
201407896	201408562			

Jobs

11512381	11513051	11513386	14005294	14005310
14005370				

Miscellaneous

Number	Title	Date
	Material Receipt Inspection Report for Residual Heat Removal Suction Relief Valves	October 17, 2013
597453	Material Receipt Inspection Report	October 17, 2013

Miscellaneous

Number	Title	Date
0255275/1	Report for Incorrect Material Received	October 17, 2013
	Email chain from C. Wood to W. Hinchie and R. Kokoska, Receipt of PO 597453 NWS RHR Pump Sunction [*sic*] Relief Valve Testing – OPEN ITEMS	October 9, 2013
0255275/2	Report for Incorrect Material Received	August 6, 2014
	NWS Technologies, LLC Bill to Callaway	December 13, 2012
597453 SR	NWS Technologies – Ameren Missouri – Callaway Energy Center Testing Completed	August 2013
NWS 13-105	NWS Technologies – Quality Release, HR Pump Suction Relief Valves	September 4, 2013
	NWS Certificate of Calibration	September 4, 2013
597453 SR	NWS Technologies, Certificate of Conformance, NWS Traveler 12-279	September 4, 2013
12-279	NWS Technologies, Safety Valve Test Traveler 12-279	September 4, 2013
NWS-T-50, Revision 1	NWS Technologies, Test Data 12-279	September 4, 2013
NWS-QA-P13-2, Revision 0	NWS Technologies, Final Cleanliness Inspection 12-279	September 4, 2013
	Email from C. Wood to J. Reese, RHR valves	September 4, 2013
597453 SR	NWS Technologies, Certificate of Conformance, NWS Traveler 12-280	September 4, 2013
12-280	NWS Technologies, Safety Valve Test Traveler 12-280	September 4, 2013
NWS-T-50, Revision 1	NWS Technologies, Test Data 12-280	September 4, 2013
12-280	NWS Technologies, Safety Valve Test Traveler 12-280	September 4, 2013
NWS-QA-P13-2, Revision 0	NWS Technologies, Final Cleanliness Inspection 12-280	September 4, 2013
	NWS Technologies, NWS Personnel Qualifications 2013	June 4, 2013
	NWS Technologies, Inspector Certification, Jason C. Gibson	
	NWS Technologies, Inspector Certification, David W. Jones	
	NWS Technologies, Inspector Certification, D. Codey Jones	

Miscellaneous

Number	Title	Date
	NWS Technologies, Inspector Certification, Thomas P. Nederostek	
	NWS Technologies, Inspector Certification, John F. Reese	
UOPME130037	Memo from William J. Hinchie and Jason L. Bruemmer to Craig Parker, PO 597453 for NWS to Test RHR Pump Suction Relief Valves	October 3, 2013
	Email from J. Bruemmer to D. Epperson, RO 0255275 for the Relief Valves	November 18, 2014

Section 1R05: Fire Protection

Procedures

Number	Title	Revision
APA-ZZ-00700	Fire Protection Program	20
APA-ZZ-00741	Control of Combustible Materials	27

Callaway Action Requests

201406961	201407339	201407374	201407909	201407975

Miscellaneous

Title	Revision
Fire Preplan Manual: Auxiliary Building Elevation 2026'-0"	38
Fire Preplan Manual: Auxiliary Building Elevation 2047'-6"	38
Fire Preplan Manual: Reactor Building Elevation 1978'-6"	
Fire Safety Analysis Calculation: KC-108, Fire Area: A-28, Auxiliary Shutdown Panel Section A	1
Fire Safety Analysis Calculation: KC-111, Fire Area: A-33, Auxiliary Shutdown Panel Section B	1

Section 1R06: Flood Protection Measures

Drawings

Number	Title	Revision
M-01EJ01	System Flow Diagram Residual Heat Removal System	E

Calculations

Number	Title	Revision
FL-02	Flooding of Auxiliary Building Rooms 1107-1114	0

Section 1R08: Inservice Inspection Activities

Procedures/Work Instructions

Number	Title	Revision/Date
EDP-ZZ-01004	Boric Acid Corrosion Control Program	17
ESP-ZZ-01016	ASME Section XI IWE Containment Pressure Boundary Inspection	6
MDP-ZZ-LM001	Fluid Leak Management Program	15
MSM-ZZ-QW005	Mechanical Snubber Functional Test	17
QCP-ZZ-05041	Visual Examination to ASME VT-2	26
QCP-ZZ-05048	Boric Acid Walkdown for Reactor Coolant System Pressure Boundary	8
QCP-ZZ-05049	Reactor Pressure Vessel Head Bare Metal Examination	3
08510270.500	Perform Ultrasonic Examination	3
11510665/500	Ultrasonic Examination of ABHV0014 Bonnet Bolting	September 28, 2011
12503620.500	Perform Surface Exam (MT) of 2-TBB03-SKIRT-W-IWA	1
08510323/500	Ultrasonic ISI Examinations TBB03	October 1, 2008
13004618.500	Tie-In Installation of New Line# AL-092-DBC-4", MP 13-0024	1
13001424.010	Pre Fabrication of New Residual Heat Removal Secondary Make up Tie-In Point	1
13004626.010	Pre Fabrication of EM High Pressure Injection Point Tie-In	4
14004657.500	Clean/Repair Boron Leak at BGFT0138A	0
13002866.0	Perform Leak Detection of the Refueling Pool	1
13002866.400	Perform Refueling Pool Leak Detection Prior to Filling	2
13002866.500	Perform Leak Detection of the Refueling Pool	2
13002866.510	Engineering Support for Refuel Pool Leak Detection	0

Non-destructive Examination Reports Numbers

UT-14-007	UT-14-001	MT-14-001	UT-14-021	UT-14-022

Jobs

08510270.500	12503620.500	13004618.500	13001424.010	13004626.010
14003510/407	11510665/500	08510323/500	14003510/530	14004657.500
14005105	13002866.0	13002867	PM0917069	PM0917071
PM0917072				

Weld Rod Issue Requisitions

205819	205820	205825	205826	205836
205837	205842	205843	205865	205866
205884	205885	205889	205890	205895
205896	205899	205900	205901	205902
205903	205904	205905	205906	205908
205909	205932	205933	205951	205952
205959	205960	205968	205969	205974
205975	205979	205980	205981	205982
205983	205984	205991	205992	205998
205999	206000	206001	206002	206003
206004	206005	206006	206007	206052
206065	206066	206070	206071	

Callaway Action Requests

201004793	201108817	201109703	201109796	201302873
201303121	201303435	201303819	201401547	201406415
201406528	201406732	201406973	201406977	201406993
201407128	201407129	201407138	201407170	201407174
201407183	201407329			

Miscellaneous

Number	Title	Revision/Date
NET 14-0034	Boric Acid Corrosion Control Program (BACCP) Quarterly Report	October 5, 2014
NET 14-0023	Boric Acid Corrosion Control Program (BACCP) Quarterly Report	July 3, 2014

Miscellaneous

Number	Title	Revision/Date
NET 14-0012	Boric Acid Corrosion Control Program (BACCP) Quarterly Report	April 15, 2014
NET 13-0059	Boric Acid Corrosion Control Program (BACCP) Quarterly Report	October 2, 2013
NET 13-0046	Boric Acid Corrosion Control Program (BACCP) Quarterly Report	July 8, 2013
NET 14-0001	Boric Acid Corrosion Control Program (BACCP) Quarterly Report	January 15, 2014
ULNRC-01779	Docket Number 50-483 Callaway Plant Response to Generic Letter 88-05 Boric Acid Corrosion of Carbon Steel Reactor Coolant Boundary Components in PWR Plants	May 27, 1988
T62.7211 Q	Callaway Engineering Qualification Standard – Perform Activities for Implementation of the Boric Acid Corrosion Control Program	4
201309684-08	Self-Assessment Topic: Material Degradation Management Plan	September 24, 2014
201309684-08	Self-Assessment Topic: Inservice Inspection Program	June 20, 2014
201100239	Benchmark Topic: Compare Welding and ASME Section XI Repair/Replacement Administrative Procedures	July 22, 2011
SA09-MM-04	Self-Assessment Topic: Effectiveness Review CAR 200705558, Welder not Certified for the Job	July 29, 2009
SA00-NE-007	Self-Assessment ASME XI Repair/Replacement and Welding Program	October 2000
WDI-PJF-1308925-FSR-001	Callaway Nuclear Power Plant Reactor Vessel Inlet Nozzle DM Weld and Clad Patch Inspection	April 2013
ULNRC-05271	Docket Number 50-483 Union Electric Company Callaway Plant 10 CFR 50.55a Requests for Relief from ASME Section XI Inservice Inspection Requirements for Third 10-Year Inspection Interval	March 28, 2006
ULNRC-05292	Docket Number 50-483 Union Electric Company Callaway Plant 10 CFR 50.55a Request for Relief from ASME Section XI Repair and Replacement Requirements: Proposed Alternative for Application of Structural Weld Overlays to Pressurizer Nozzle Welds	August 14, 2006
ULNRC-05344	Docket Number 50-483 Union Electric Company Callaway Plant Response to Request for Additional Information Regarding 10 CFR 50.55a Request 13R-01 (Request for Relief from ASME Section XI Inservice Inspection Requirements for Third 10-Year Inspection Interval)	November 29, 2006

Miscellaneous

Number	Title	Revision/Date
ULNRC-06048	Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 10 CFR 50.55a Request: Proposed Alternative to ASME Section XI Requirements Regarding System Leakage Tests of Class 1 Piping and Components Isolated Between Normally Closed Valves	October 17, 2013
ULNRC-06071	Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Response to Request for Additional Information RE: 13R-15, Proposed Alternative Regarding Pressure Retaining Boundary During System Leakage Test (TAC No. MF2921)	January 29, 2014
ULNRC-06092	Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Relief Request 13R-16 for Temporary Non-Code Repair of the train A Component Cooling Water Heat Exchanger	March 19, 2014
ULNRC-06093	Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Proposed Alternative to ASME Code, Section XI Requirements, which Extends Reactor Vessel Inservice Inspection Frequency from 10 to 20 Years (Relief Request 13R-17)	April 8, 2014
	Callaway Energy Center Steam Generator Tube Inspection Report	2012

Section 1R11: Licensed Operator Requalification Program

Procedures

Number	Title	Revision
OTG-ZZ-00001, Addendum 1	Auxiliary Spray Operation	5
OTG-ZZ-00002	Reactor Startup	54
OTG-ZZ-00003	Plant Startup Hot Zero Power to 30% Power – IPTE	59
OTG-ZZ-00004	Power Operations	88
OTG-ZZ-00004, Addendum 2	End of Life Coastdown Operations	6

Miscellaneous

Number	Title	Revision
T61.JITTS	Just In Time Training Session Number 20141672	0

Section 1R12: Maintenance Effectiveness

Procedures

Number	Title	Revision
APA-ZZ-00500, Appendix 14	Adverse Condition – Significance Level 3	20
APA-ZZ-01400, Appendix K	Tools for Event Prevention	10
EDP-ZZ-01128, Appendix 2	Summary of SSC Performance Criteria	26

Miscellaneous

Number

Suggestion Occurrence Solution 199200357

Modification Package 00-1018

Modification Package 10-0003

Modification Package 10-0004

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

Procedures

Number	Title	Revision
APA-ZZ-00365	Callaway Lifting and Rigging Program	25
APA-ZZ-00365, Addendum L	Callaway Lifting Operations	16
EDP-ZZ-01129, Attachment 5B	Shutdown Safety Assessment – Mode 5 – Loops not Filled or Mode 6 – Reactor Coolant System Inventory Between 3 feet Below Vessel Flange (Indicated Level of 64.1”) and 23 feet Above Vessel Flange (Indicated Level of 376.0”)	42
EDP-ZZ-01129, Attachment 7	Shutdown Safety Assessment – No Mode	42
ODP-ZZ-00002, Appendix 1	Protected Equipment Program	22
ODP-ZZ-00002, Appendix 2	Postings for Lowered Inventory Operations	2
OTO-EJ-00001	Loss of Residual Heat Removal Flow	31

Callaway Action Requests

201407696 201407713

Jobs

13004893

Section 1R15: Operability Evaluations

Procedures

Number	Title	Revision
MSM-KJ-QK001	Emergency Diesel Generator Inspection	34

Callaway Action Requests

201303740 201407283 201407444

Jobs

12503092

Section 1R19: Post-Maintenance Testing

Procedures

Number	Title	Revision
MSM-KJ-QK001	Emergency Diesel Generator Inspection	34
OSP-AL-PV04B	Train B Motor Driven Auxiliary Feedwater Comprehensive Pump and Check Valve Test	17
OSP-AL-PV04B, Attachment 1	Train B Valve Test Data	17
OSP-AL-V001B, Attachment 1	Valve Test Data Sheet	52
OSP-SA-00004	Visual Inspection of Containment for Loose Debris	25

Drawings

Number	Title	Revision
M-23BG22	Piping Isometric, CVCS – Letdown, Reactor Building	16

Callaway Action Requests

201010669 201404221 201404656 201407757 201408809

Jobs

12503092	13505272	14002786	14003781	14005318
14005357	14006129	14006195		

Miscellaneous

Title	Date
Burns & McDonnell letter to Mr. Roger Andreasen regarding Evaluation of Localized Defects in EF-009-HBC-30"	November 5, 2014

Section 1R20: Refueling and Other Outage Activities

Procedures

Number	Title	Revision
APA-ZZ-00908	Fitness For Duty Programs	32
APA-ZZ-00911	Fatigue Management	4
ETP-ZZ-00012	Inverse Count Rate Ratio Monitoring for Approach to Criticality	14
OSP-SA-00004	Visual Inspection of Containment for Loose Debris	25
OTG-ZZ-00002	Reactor Startup - IPTE	54
OTG-ZZ-00003	Plant Startup Hot Zero Power to 30 Percent Power - IPTE	59
OTG-ZZ-00004	Power Operations	88
OTG-ZZ-00005	Plant Shutdown 20 Percent Power to Hot Standby	45
OTG-ZZ-00006	Plant Cooldown Hot Standby to Cold Shutdown	72
OTG-ZZ-00007	Refueling Preparation, Performance and Recovery	35
OTN-BB-00001	Reactor Coolant System – IPTE	44
OTN-BB-00001, Addendum 1	Reactor Coolant System Vacuum Eductor Connections	2
OTN-BB-00002, Addendum 6	Draining the Reactor Coolant System to Limited Inventory or Reduced Inventory – IPTE	24
OTS-KE-00013	Refueling Machine	31

Callaway Action Requests

201407675	201407934	201407968	201408487

Jobs

13505838	13508285

Miscellaneous

Number	Title	Revision/Date
	Callaway Energy Center RF20 Shutdown Safety Management Plan	August 19, 2014
Figure 14.9	Callaway Plant Pressure and Temperature Limits Report	6
	Callaway Refueling Outage 20 – Overview	October 10, 2014
	Refuel 20 – Major Scope Summary	September 23, 2014
	Refuel 20 – Operation Control Room Schedule	September 26, 2014
	Refuel 20 – Outage Organization	October 7, 2014
32-9180957	Areva Calculation Summary Sheet: Callaway Reactor Vessel Head Drop Model	1

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
ESP-ZZ-00024	Low Power Physics Testing Data Acquisition	9
ETP-ZZ-ST010	Low Power Physics Test Program With Dynamic Rod Worth Measurement – IPTE	11
ODP-ZZ-00029	RCS Leakage Action Level Guideline	4
OSP-AC-00005	Turbine Actual Overspeed Trip	11
OSP-BB-00009	RCS Inventory Balance	36
OSP-EM-P001A	Safety Injection Train A Inservice Test – Group B	50
OSP-NE-0001B	Standby Diesel Generator B Periodic Tests	59
OSP-NE-00002	Simultaneous Start of Both Diesel Generators	20
OSP-NE-00002, Attachment 1	Simultaneous Start of Both Diesel Generators Data Sheet	20
OSP-NE-0024B	Standby Diesel Generator B 24 Hour Run and Hot Restart Test	49

Callaway Action Requests

201406967	201407222	201407237	201407239	201407245
201407246	201407248	201407254	201407268	201407270

Callaway Action Requests

201407290	201407305	201407311	201408807	201408809

Jobs

04501245	08502992	13503547	13503949	13506675
13508126	14004748	14004966	14508849	

Miscellaneous

Number	Title	Date
Calculation GN-17	Containment Cooler Water Hammer Analysis	July 21, 1992
	Letter RE: Fathom/Impluse [*sic*] Comparison of SGK04 and SGN01B Pressures, from T. DeVincentis, Archon Engineering, P.C. to C. Norman	October 23, 2014

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures

Number	Title	Revision
APA-ZZ-01000	Callaway Energy Center Radiation Protection Program	39
APA-ZZ-01000 Appendix A	Control of Radioactive Material	16
HDP-ZZ-01500	Radiological Postings	42
HTP-ZZ-02004	Control of Radioactive Sources	38
HTP-ZZ-06001	High Radiation/Locked High Radiation/Very High Radiation Area Access	47

Audit and Self Assessments

Number	Title	Date
201308863-07	Self-Assessment – HRA/LHRA/VHRA Controls	March 21, 2014
201309864-24	Self-Assessment – STARS Radiation Protection Fundamentals	June 20, 2014
OQC 14-003	Nuclear Oversight Performance Report 4th Quarter 2013	January 27, 2014

Callaway Action Requests

200503146	201302963	201303275	201303901	201306521
201308866	201400781	201401142	201405757	201407541

Radiation Work Permits

Number	Title	Revision
13004060	BB8948A Disassembly and Repair	1
13004098	EMV0057 Radiography	2
200812209	Replace B Reactor Coolant Pump (PBB01B) Cartridge Seal Assembly	0

Survey Documentation

Number	Title	Date
CA-M-20140731-3	7404D Demin Valve Compartment	July 31, 2014
CA-M-20140819-11	1308B Valve Compartment – Depost from HRA	August 19, 2014
CA-M-20140820-3	7404A Demin Valve Compartment	August 20, 2014
CA-M-20140829-3	7404B Demin Valve Compartment	August 29, 2014
CA-M-20140912-7	6204 Ultrasonic Cleaner to Wash Down Pit	September 12, 2014
CA-M-20140922-9	Pre-Decon of Cask Wash Down Pit	September 22, 2014
CA-M-20141015-26	RB-200-I Survey inside bio- Routine	October 15, 2014
CA-M-20141020-12	7404E Demin Valve Compartments	October 20, 2014
CA-M-20141020-5	7404C Demin Valve Compartment	October 20, 2014
CA-M-20141027-31	RB-200-I Survey inside bio- Routine	October 27, 2014

Air Sample Results

Sample Number	Title	Date
1410280415	EPHV8879A Valve Breach	October 28, 2014
1410280855	Job Coverage – RB Seal Table	October 28, 2014
1410281010	BB8948A - Lapping	October 28, 2014
1410281720	BB8948A	October 28, 2014
1410282358	Routine	October 29, 2014

Miscellaneous Documents

Number	Title	Date
	Callaway Radioactive Source Listing	September 24, 2014
	Sealed Source Leak Test Results	January 7, 2014
	Sealed Source Leak Test Results	June 9, 2014

Miscellaneous Documents

Number	Title	Date
Drawing C252919	Reactor Building In-Core Instrumentation Tue Supports and Platforms	

Section 2RS3: In-plant Airborne Radioactivity Control and Mitigation

Procedures

Number	Title	Revision
APA-ZZ-01004	General Instructions For Donning And Removing Respiratory Equipment	6
HDP-ZZ-08000	Respiratory Protection Program	22
HTP-ZZ-08300-DTI-Airlpak75	Scott Air Pak 75 SCBA Respirator Inspection and Storage	7
HTP-ZZ-08300-DTI-Skapak	Skapak AT SCBA Respirator Storage and Inspection	4
HTP-ZZ-08501-DTI-Air Test	Testing of Breathing Air	4

Callaway Action Requests

201004639	201305409	201308548	201403168	201403872
201406718	201406788			

Lesson Plans and Training Guidance

Number	Title	Date
T210.0002	Air Pak Proficiency Demonstration	March 2, 2011
T64.JT286	RP Just-In-Time Training – Delta Suit User	

Breathing Air Test Results

	Title	Date
	Breathing Air Sample Data Sheet	September 18, 2014
	Breathing Air Sample Data Sheet	July 11, 2014
	Breathing Air Sample Data Sheet	April 7, 2014

Training Certificates

Number	Title	Date
Technician A	Air-Pak 2.2/3.0/4.5/Fifty/75 SCBA Maintenance and Overhaul	September 20, 2014
Technician B	Air-Pak 2.2/3.0/4.5/Fifty/75 SCBA Maintenance and Overhaul	September 20, 2014
Technician C	Air-Pak 2.2/3.0/4.5/Fifty/75 SCBA Maintenance and Overhaul	September 22, 2013

Miscellaneous

Title	Date
Delta Protection Mururoa Blu Single-Use Respiratory Protection Suit (TAC No MD 3333) Approval	December 18, 2006
Operations Crew Roster	October 30, 2014
Respiratory Protection Equipment Inspection Records	May 6, 2014
2014 On-Shift (Operations) Crew Schedule	

Section 4OA1: Performance Indicator Verification

Miscellaneous

Title	Date
Consolidated Data Entry 4.0, MSPI Derivation Report, MSPI High Pressure Injection System, Unavailability Index	September 2014
Consolidated Data Entry 4.0, MSPI Derivation Report, MSPI High Pressure Injection System, Unreliability Index	September 2014
Consolidated Data Entry 4.0, MSPI Derivation Report, MSPI Residual Heat Removal System, Unavailability Index	September 2014
Consolidated Data Entry 4.0, MSPI Derivation Report, MSPI Residual Heat Removal System, Unreliability Index	September 2014
NRC Performance Indicator Transmittal Report, Fourth Quarter 2013, Mitigating Systems Cornerstone	January 9, 2014
NRC Performance Indicator Transmittal Report, First Quarter 2014, Mitigating Systems Cornerstone	April 9, 2014
NRC Performance Indicator Transmittal Report, Second Quarter 2014, Mitigating Systems Cornerstone	July 1, 2014
NRC Performance Indicator Transmittal Report, Third Quarter 2014, Mitigating Systems Cornerstone	October 8, 2014

Section 4OA2: Identification and Resolution of Problems

Procedures

Number	Title	Revision/Date
APA-ZZ-00500	Corrective Action Program	61
ODP-ZZ-00001, Addendum 12	Operator Burdens and Workarounds	4
ODP-ZZ-00002	Equipment Status Control	75
ODP-ZZ-00008	Night Orders – Standing Orders – Operations Information Reports	13
OSP-BB-VL006	RCS Pressure Isolation Valves Inservice Tests – IPTE	43
OSP-EP-00001, Checklist 1	Accumulator Isolation Valves Pwr Removed Verification – 17566	November 16, 2014
OTG-ZZ-00001, Addendum 2	Safety Injection Accumulator Preparation	3

Callaway Action Requests

201403798	201403895	201404092	201404344	201408530

Jobs

13507340	14509428

Miscellaneous

Title	Date
Adverse and Emerging Trends Between 2014/06/01 and 2014/12/02	December 2, 2014
Corrective Action Review Board Package	December 17, 2014

Section 4OA3: Event Follow-Up

Procedures

Number	Title	Revision/ Date
OTG-ZZ-00008	Normal Unit Recovery Guideline Following Reactor Trip	19
APA-ZZ-00542, Attachment 2	Post Transient Evaluation Report – Trip Number 83	December 4, 2014

Callaway Action Requests

201408897 201408898 201408899

Miscellaneous

Title	Date
Sequence of Events Log	December 3, 2014
DNA History Plot – Main Turbine Speed	December 3, 2014
DNA History Plot – Steam Generator Narrow Range Water Level	December 3, 2014
Various Photos of Damaged Cables	December 4, 2014

Section 4OA5: Other Activities

Procedures/Work Instructions

Number	Title	Revision/Date
N-8080-10	Technical Manufacturing Program for Forged Part for Closure Head	B
APA-ZZ-01105	Site Access	38
APA-ZZ-01109	Safety/Security Interface Program	2
SDP-CP-00001	Site Protective Strategy	17
SDP-PI-DOORS	Posting Portals and Barriers	14
SDP-PI-VEHAC	Vehicle Access/Control	36
SDP-SF-00011	Compensatory Measures	22
51-9217229-003	Rigging Plan – Callaway Reactor Vessel Closure Head Replacement	January 30, 2014
51-9093520-002	Callaway Plant Unit 1 Heavy Rigging	January 30, 2014
03-9199483	Callaway Site Requirements Document 2014 RVCH Replacement RF-20	0
51-9217961-000	Cribbing Reference Information – Callaway Unit 1 Reactor Vessel Closure Head Replacement	January 30, 2014
2348-P4	Procedure to Downend Replacement Reactor Vessel Closure Head Outside Reactor Building	February 27, 2014
15005435-W-M01	Delivery of 160T Replacement Reactor Vessel Closure Head	April 17, 2014
2348-P7	Procedure to Install Bigge Hatch Runway System	October 22, 2013

Procedures/Work Instructions

Number	Title	Revision/Date
2348-P6	Procedure to Install Upending Frame Inside Reactor Building	February 27, 2014
50-9217796-000	Callaway Unit 1 Pre-Outage Master Traveler	May 21, 2014
2348-P10	Procedure to Move Replacement Reactor Vessel Closure Head into Reactor Building	February 28, 2014
02348-D3	Multi-Axle Transporter Land “G” Forces Pre-Outage Transportation	May 26, 2014
02348-D2	Multi-Axle Transporter Land “G” Forces for Onsite Transportation	April 30, 2014
03-9216566	Callaway Unit 1 Placement and Storage of Old Reactor Vessel Closure Head in Old Steam Generator Storage Facility	0
2348-P12.1	Procedure for Pre-Outage Work Load Testing	April 4, 2014
2348-P5	Procedure to Remove Missile Shield from Reactor Building	April 4, 2014
2348-P8	Procedure to Remove Old Reactor Vessel Closure Head from Reactor Building	February 27, 2014
51-9179592-001	Requirements for Temporary Assembly Building at Callaway Energy Center	October 18, 2010
03-9209907	Callaway Unit 1 Rolling Missile Shield Disassembly and Removal Procedure	1
2348-P13	Procedure for Replacement Reactor Vessel Closure Head Barge Offload	1
01-9218057-001	Disassembly of the Tooling for Transporting the Reactor Vessel Head with Control Rod Drive Mechanisms Callaway 1	B
2348-P2	Procedure to Upend Replacement Reactor Vessel Closure Head Shipping Package and Place in Head Assembly Building	May 7, 2014
2348-P11	Procedure to Transport Integrated Head Assembly Pieces into Reactor Building	February 28, 2014
2348-P1	Procedure to Transport Replacement Reactor Vessel Closure Head Shipping Package from Barge Offload Site to Head Assembly Building	2
2348-P3	Procedure to Transport Replacement Reactor Vessel Closure Head to Reactor Building	February 28, 2014

Procedures/Work Instructions

Number	Title	Revision/Date
2348-P9	Procedure to Upend Old Reactor Vessel Closure Head and Transport to Old Steam Generator Storage Facility	February 27, 2014
APA-ZZ-00365, Addendum L	Callaway Lifting Operations	14
APA-ZZ-00365 Addendum R	Callaway Rigging Operations	8
ETP-BB-03147 Addendum 1	Installation of Reactor Vessel Head Lifting Rig	5
ETP-BB-03147	Reactor Vessel Head Removal-IPTE	20
ETP-BB-03154	Reactor Vessel Head Installation-IPTE	19
MP-127-003	Areva Integrated Head Tripod Load Testing	0
EDP-ZZ-04060	Post-Design and Configuration Change Testing	6
MP-10-0005	Post-Change Test Plan – Reactor Pressure Boundary Leakage	0
ESP-SF-00001	Rod Drop Testing Using the Plant Computer - IPTE	24
ESP-SQ-00001	Loose Parts Background Noise	13
ESP-SQ-00002	Loose Parts Monitor Baseline Data Acquisition	2
ESP-ZZ-00020	Rod Position Indication Checkout – IPTE	15
ESP-ZZ-00032	Test Procedure for Automated Measurement of Drop Times of Control and Shutdown Rods in Westinghouse PWRS WITH DRPI Power-On	2
ETP-BB-03159	Reactor Vessel Head Electrical Interference Installation	15
ISL-SQ-00Y64	Loose Parts Monitor System Cabinet SQ064 Loop Calibration	24
ITM-SF-00002	DRPI Troubleshooting Guidelines - Cable and Detector Coil Continuity/Integrity Testing	6
OSP-BB-V002B	Reactor Vessel Head Vent Valves Inservice Test	14
OSP-SF-00002	Control Rod Partial Movement	22
OSP-SH-00001	PAM Channel Check	28
QCP-ZZ-05041	Visual Examination to ASME VT-2	26
ESP-ZZ-00020	Rod Position Indication Checkout - IPTE	15
OTS-SF-00002	Control Rod Exercising for CRDM Crud Mitigation Mode 5	1

Procedures/Work Instructions

Number	Title	Revision/Date
OTS-SF-00003	Control Rod Exercising for CRDM Crud Mitigation Mode 3	0
RP-DTI-Job-Cov-Refuel-Mtc-Guide	Refueling Maintenance Guide	8

Radiation Work Permits

Number	Title	Revision
13004902	RP and Decon Support for RVCH Replacement	1
13004889	Low Dose Disassembly/Reassembly of RVCH	1
13004898500	Remove, Transport, Place ORVCH in Storage	0
13004895500	High Dose Activities for Demolition of ORVCH	0
13004895302	Scaffold for Reactor Head Replacement	2
13004889450	Temporary Shield Reactor Vessel Closure Head on Head Stand	0
13004895	Clean Area Work for Reactor Head Replacement	0

Survey Documentation

Number	Title	Date
CA-M-2013-0503-14	RBHEAD – Reactor Head	May 3, 2013
CA-M-2014-0401-2	Old Steam Generator Storage Facility	April 1, 2014
CA-M-2014-1022-22	RB2047 Reactor Head Survey	October 22, 2014
CA-M-2014-1023-10	Reactor Head Scaffold Levels 1 and 2	October 23, 2014
CA-M-2014-1024-11	RB2047 Reactor Head Scaffold Levels 3 and 4	October 24, 2014
CA-M-2014-1031-28	Old Steam Generator Storage Facility	October 31, 2014
CA-M-2014-1102-15	Old Steam Generator Storage Facility Old Reactor Vessel Closure Head Vault Plant Side South	November 1, 2014

Calculations

Number	Title	Revision/Date
32-9214732-000	Callaway Old Reactor Vessel Closure Head Storage Floor Loading Evaluation	January 30, 2014
32-9212628-000	Callaway Reactor Vessel Closure Head Haul Route Evaluation	January 30, 2014

Calculations

Number	Title	Revision/Date
32-9216352-000	Callaway Reactor Vessel Closure Head Outside Lift System Foundation	January 30, 2014
32-9220596-000	Callaway Reactor Vessel Closure Head Reactor Building Floor Loading Justification	January 30, 2014
02348-D1	Design Basis - Engineering, Rigging and Transport Services, Reactor Vessel Head Replacement Project - Callaway	May 26, 2014
C7.2	Head Assembly Building Cribbing - Concrete Stools	0
C1.1	Replacement Reactor Vessel Closure Head Shipping Package Gantry Upending	3
C2.1	Hatch Transfer Runway	3
C3.2	Inside Upending Frame	4
C2.4	Missile Shield Cart	2
C4.4	Missile Shield Lift Rigging	1
C4.5	Mobile Crane Setup	2
C5.1	Old Reactor Vessel Closure Head & Replacement Reactor Vessel Closure Head Trailer Configuration	2
32-9216352-000	Callaway Reactor Vessel Closure Head Outside Lift System Foundation	18
C5.2	Old Reactor Vessel Closure Head & Replacement Reactor Vessel Closure Head Transporter Tiedowns	2
C4.1.1	Old Reactor Vessel Closure Head Upend/Downend Rigging Attachments	3
C3.1	Outside Upending Frame	1
C6.1	Pre-Outage Work Load Testing	0
C5.3	Replacement Reactor Vessel Closure Head Shipping Package Trailer Configuration	4
C5.4	Replacement Reactor Vessel Closure Head Shipping Package Transporter Tiedowns	3
C3.3	Replacement Reactor Vessel Closure Head Staging Location Cribbing	1
C4.1.2	Replacement Reactor Vessel Closure Head Upend/Downend Rigging Attachments	1
C2.2	Reactor Vessel Closure Head Cart	1
C4.3	Reactor Vessel Closure Head Horizontal Rigging	1

Calculations

Number	Title	Revision/Date
C4.2	Reactor Vessel Closure Head Vertical & Upend Rigging	1
C2.3	Utility Cart	1
32-9180957-001	Callaway Reactor Vessel Head Drop Model	17
32-9183546-000	Callaway Reactor Vessel Head Drop Analysis	17
BB-18	Evaluate the Impact to the Existing Head Drop Analyses Due to Integrated Head Assembly Installation	0
51-9201488-001	Callaway Upper Integrated Head Assembly Safe Load Path Evaluation	November 20, 2012
33-9132947-000	Callaway Plant Unit 1 Reactor Head Replacement – Integrated Head Assembly Design Report	0
51-9217961-000	Cribbing Reference Information – Callaway Unit 1 Reactor Vessel Closure Head Replacement	January 30, 2014
24430-CALC-N-004	Callaway Reactor Vessel Head Storage Building Shielding Requirements	0

Drawings

Number	Title	Revision
1HB1.30S0	Closure Head Shipping General Arrangement	2
02-9194984B-000	Cribbing for Replacement Reactor Closure Head Staging	1
02-9194958B-000	Downend and Staging of Replacement Reactor Vessel Closure Head	1
9223154B	Callaway Nuclear Plant Reactor Vessel Closure Head Replacement Reactor Building Equipment Hatch Access Platform Stiffener Plate Notes	0
9223156B	Callaway Nuclear Plant Reactor Vessel Closure Head Replacement Reactor Building Equipment Hatch Access Platform Stiffener Plate Sections	0
9223155B	Callaway Nuclear Plant Reactor Vessel Closure Head Replacement Reactor Building Equipment Hatch Access Platform Stiffener Plates Plan	0
02-9194973B-000	Hatch Transfer Runway Plan View	3
02-9194983B-001	Inside Containment Upend/Downend Frame Isometric View	2
02-9194961B-000	Install of Replacement Reactor Vessel Closure Head into Containment	1
02-9195006B-000	Lift Exclusion Zones	1

Drawings

Number	Title	Revision
02-9194977B-000	Missile Shield Cart Assembly General Arrangement – Isometric View	1
02-9217364D	Callaway Unit 1 Rolling Missile Shield End Truck Restraint Tie Down Plates	0
02-9216633E	Callaway Unit 1 Rolling Missile Shield End Truck Temporary Restraints	0
52	Missile Shield Lifting Rigging Orthographic Views	2
02-9195007B-000	Mobile Crane Mat Layout Bottom Level Plan	1
02-9194962B-000	Move Integrated Head Components into Containment Equipment Lift onto Access Platform	1
02-9194980B-000	Reactor Vessel Head Replacement Isometric View Old Reactor Vessel Head Upend/Downend System	1
02-9194982B-000	Outside Upending Frame Isometric View	1
02-9195000B-001	Pre-Outage Work Equipment Testing Gantry Link/HGL-2	1
02-9194963B-000	Removal of Missile Shield for Reactor Building Plan View – Cart Staging	1
02-9194959B-000	Removal of Old Reactor Vessel Closure Head from Containment Vertical Lift Rigging Install	1
81	Replacement Reactor Vessel Closure Head Downend Frame Test Assembly Isometric Views	0
02-9194996B-001	General Arrangement – Transportation Replacement Reactor Vessel Closure Head Shipping Package Barge Offload	2
02-9194957B-001	Replacement Reactor Vessel Closure Head Shipping Package Upending and Storage Upending general Arrangement	2
02-9194995B-000	Replacement Reactor Vessel Closure Head Shipping Package Transport to Head Assembly Building Haul Route General Arrangement	4
02-9194981B-001	Reactor Vessel Head Replacement Isometric View Replacement Reactor Vessel Closure Head Upend/Downend System	1
02-9194967B-001	Replacement Reactor Vessel Closure Head Shipping Package Gantry Assembly – Plan	3
02-9194974B-000	Reactor Vessel Closure Head Runway Cart Assembly General Arrangement - Isometric View	2

Drawings

Number	Title	Revision
02-9194988B-000	Reactor Vessel Closure Head Horizontal Rigging – Inside Isometric View	1
02-9194989B-000	Reactor Vessel Closure Head Vertical & Upend/Downend Rigging – Inside Isometric View	1
02-9194994B-001	Reactor Vessel Closure Head Onsite Transport Heavy Haul Route	4
02-9194997B-000	Reactor Vessel Closure Head Horizontal Rigging – Outside Isometric View	1
02-9194998B-000	Reactor Vessel Closure Head Vertical and Upend/Downend Rigging – Outside Isometric View	1
02-9194975B-000	Utility Cart Assembly General Arrangement – Isometric View	1
02-9194960B-000	Upend Old Reactor Vessel Closure Head and Load to Transport Plan View	1
8600-X-88100	Property-Site Layout Owner Controlled Area and Surrounding Area	66
8600-X-90706	Old Steam Generator Storage Facility Concrete Plans	0
8600-X-90707	Old Steam Generator Storage Facility Concrete and Reinforcing Sections	0
1HB1.1001	Closure Head Cladding Machining and Weld Lugs	6
1HB1.1001	Closure Head Cladding Machining and Weld Lug	7
BUMPCA/NCC0530	CETNA Assembly	
BUMPCA/NCC0430	CRDM Assembly and Welding	

Callaway Action Requests

200708758	201002759	201003045	201104123	201104568
201104569	201204894	201204623	201204661	201204801
201205101	201205138	201205302	201305503	201305327
201305423	201305426	201305556	201305604	201305676
201305731	201305742	201305768	201305807	201305823
201305856	201315676	201406137	201406201	201406264
201406264	201407696	201408368	201408381	201408385

Corrective Action Requests

NCR-1HB1-007 NCR-1HB-011 NCR-1HB-012 EHM-203-10

ALARA Plans

RWP Number	Title	Date
13004889	ALARA Plan – Level 1	June 17, 2014
13004895	ALARA Plan – Level 1	June 17, 2014
13004889500	ALARA Planning Open Item Checklist	May 29, 2014
13004889500	ALARA Plan – Level 2	May 29, 2014
13004895302	ALARA Planning Open Item Checklist	May 28, 2014
13004895302	ALARA Plan – Level 2	June 16, 2014
13004898500	ALARA Planning Open Item Checklist	June 16, 2014
13004898500	ALARA Plan – Level 2	June 16, 2014

ALARA In Progress Reviews

2014-071	Work In-Progress ALARA Review – R20-55220 New Reactor Vessel Closure Head RF 20 Head Replacement	August 20, 2014
2014-071	Work In-Progress ALARA Review – R20-55220 New Reactor Vessel Closure Head RF 20 Head Replacement	October 26, 2014

Miscellaneous

Number	Title	Revision/Date
1CA2510	Applicability Determination – “Implement an Integrated Head Assembly in RF20 in Support of Replacement Reactor Vessel Head Project”	4
1CA2511	50.59 Screen - “Implement an Integrated Head Assembly in RF20 in Support of Replacement Reactor Vessel Head Project”	4
5CA2510	Applicability Determination – Replace Pressure Boundary Components Associated with Replacement Reactor Vessel Head	4
5CA2511	50.59 Screen - Replace Pressure Boundary Components Associated with Replacement Reactor Vessel Head	4
13-003	50.59 Evaluation - Implement an Integrated Head Assembly in RF20 in Support of Replacement Reactor Vessel Head Project	0

Miscellaneous

Number	Title	Revision/Date
STARS – ENG – 5001 – 8.1	Engineering Disposition – Implement an Integrated Head Assembly in RF20 in support of Replacement Reactor Vessel Closure Head Project	September 4, 2012
51-9185539-002	Callaway Unit 1 Reactor Vessel Closure Head ASME Code Reconciliation	October 21, 2013
	Contract Between Union Electric Company d/b/a Ameren UE and Areva NP Inc. for Reactor Vessel Head Replacement Services for the Callaway Nuclear Plant	July 20, 2009
M-2012 (Q)	Technical Specification for the Replacement Reactor Vessel Closure Head Project	5
33-9180485-002	ASME Design Report for Callaway Unit 1 Replacement Reactor Vessel Closure Head	November 20, 2012
87-9182060-001	Contract Variation Approval Request	August 13, 2012
87-9200533-000	Contract Variation Approval Request	March 14, 2013
TEC-13-076	Final Report of the Operational Inspection Performed on the Replacement Reactor Vessel Closure Head for Callaway Unit 1	2
TEC-13-114	Final Report of Ultrasonic Inspection, Eddy Current Inspection, and Visual Inspection on the Replacement Reactor Vessel Closure Head for Callaway 1 Nuclear Power Plant	2
N-8080-10	Technical Manufacturing Program for Forged Part for Closure Head	B
JQA-10-129	Certified Material Test Report	June 29, 2013
QP-08	Closure Head Hydrostatic Test and Pre-service Inspection	2
BUQRCA/NCC002	End of Manufacturing Report CC/CA001 for Thermocouples for Callaway Unit 1	A
1HB1/015	Welding Material Receiving Inspection Report	02
1HB1/016	Welding Material Receiving Inspection Report	2
1HB1/017	Welding Material Receiving Inspection Report	1
1HB1/018	Welding Material Receiving Inspection Report	2
1HB1/020	Welding Material Receiving Inspection Report	0
1HB1/021	Welding Material Receiving Inspection Report	0
1HB1/022	Welding Material Receiving Inspection Report	0

Miscellaneous

Number	Title	Revision/Date
PQR-1128	Procedure Qualification Record	January 3, 2005
1HB1 WT 207	Welding Procedure Specification	4
QP-06	Shrink Fitting and Head Penetration Nozzle Weld (ILH, Thermal, Vent, and Reactor Vessel Level Indicating System) Quality Assurance Data Package	4
1HB1CS401	Liquid Penetrant Examinations - Replacement Reactor Vessel Closure Head for Callaway Unit 1	3
PQR 1068	Procedure Qualification Record	October 10, 2002
1HB1 WT 109	Welding Procedure Specification	2
QP-06 SRP02	Standard Repair Process Cycle for the Head Penetration Nozzles Quality Assurance Data Package	1
QP-06 SRP03	Repair Process to J-Groove 1B-10.08.XX Quality Assurance Data Package	1
QP-06 SRP03	Repair Process to ILH No. 66 Quality Assurance Data Package	0
PQR-966	Welding Procedure Qualification between Inconel Buttering on P3 Gr3 with Shielded Metal Arc Welding Process and Inconel 690 material (GTAW-SMAW Process)	April 30, 1999
23-9215950-001	Quality Assurance Data Package for Control Rod Drive Mechanism Type L106-A1 Two Rod Travel Housings (Spare Parts) Callaway Plant Unit 1	April 23, 2014
23-9212915-001	Quality Assurance Data Package for Control Rod Drive Mechanism Assembly Type L106-A1 Callaway Plant Unit 1	April 23, 2014
FN9-2078	Certified Material Test Report - Replacement Reactor Vessel Closure Head	C
1HB1CS401	Liquid Penetrant Examinations - Replacement Reactor Vessel Closure Head for Callaway Unit 1	4
1HB1FS502	Painting, Final Cleaning and Preparation for Transport - Replacement Reactor Vessel Closure Head for Callaway Unit 1	3
02-9195006B-000	Lift Exclusion Zones, Exterior Exclusion Zones, Reactor Vessel Head Replacement, Callaway Power Plant, Unit 1/AREVA NP, Inc.	April 8, 2014
RRVCH-ANP 13-0418	Ameren Response to AREVA 13-02784, Request for Design Input to Radiological Drop Evaluation for the Old Reactor Vessel Closure Head	November 15, 2013

Miscellaneous

Number	Title	Revision/Date
T64.03040.8	Radiation Protection Continuing Training: Reactor Head Replacement	July 18, 2013
T64.03040.8	Radiation Chemistry Retraining – RP Operations: Reactor Head Modification Work	June 18, 2014

The following items are requested for the
Occupational Radiation Safety Inspection
at Callaway Plant
October 27-31, 2014
Integrated Report 2014005

Inspection areas are listed in the attachments below.

Please provide the requested information on or before September 25, 2014.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.0**1** 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 Larry Ricketson at (817) 200-1165 or Larry.Ricketson@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) and Performance Indicator Verification (71151)

Date of Last Inspection: April 15, 2013

A. List of contacts 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

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats 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

a. All radioactive sources that are required to be leak tested
b. All radioactive sources that meet the 10 CFR Part 20, Appendix E, Category 2, and above threshold. Please indicate the radioisotope, initial and current activity (w/assay date), and storage location for each applicable source.

J. The last two leak test results for the radioactive sources inventoried and required to be leak tested (If applicable, specifically provide a list of all radioactive source(s) that have failed its leak test within the last two years.)

K. A current listing of any non-fuel items stored within your pools, and if available, their appropriate dose rates (Contact / @ 30cm)

L. Computer printout of radiological controlled area entries greater than 100 millirems since the previous inspection to the current inspection entrance date
(The printout should include the date of entry, some form of worker identification, the radiation work permit used by the worker, dose accrued by the worker, and the electronic dosimeter dose alarm setpoint used during the entry (for Occupational Radiation Safety Performance Indicator verification in accordance with IP 71151)).

3. In-Plant Airborne Radioactivity Control and Mitigation (71124.03)
Date of Last Inspection: August 27, 2012

A. List of contacts and telephone numbers for the following areas:
1. Respiratory Protection Program
2. Self-contained breathing apparatus

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support (SCBA), and LERs, written since date of last inspection related to:
1. Installed air filtration systems
2. Self-contained breathing apparatuses

D. Procedure index for:
1. Use and operation of continuous air monitors
2. Use and operation of temporary air filtration units
3. Respiratory protection

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. Respiratory protection program
2. Use of self-contained breathing apparatuses
3. Air quality testing for SCBAs
4. Use of installed plant systems, such as containment purge, spent fuel pool ventilation, and auxiliary building ventilation

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the Airborne Monitoring program including:
1. Continuous air monitors
2. Self-contained breathing apparatuses
3. Respiratory protection program

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

G. List of SCBA qualified personnel - reactor operators and emergency response personnel

H. Inspection records for self-contained breathing apparatuses (SCBAs) staged in the plant for use since date of last inspection

I. SCBA training and qualification records for control room operators, shift supervisors, STAs, and OSC personnel for the last year

   A selection of personnel may be asked to demonstrate proficiency in donning, doffing, and performance of functionality check for respiratory devices

J. List of respirators (available for use) by type (APR, SCBA, PAPR, etc.), manufacturer, and model

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. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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Information Request
January 22, 2014
Notification of Inspection and Request for Information
Callaway Plant
NRC Inspection Reports 05000483/2014004 and 05000483/2014005

On October 20, 2014, reactor inspectors from the Nuclear Regulatory Commission's (NRC) Region IV office will perform the baseline inservice inspection at Callaway Plant, using NRC Inspection Procedure 71111.08, "Inservice Inspection Activities." Experience has shown that this inspection is a resource intensive inspection both for the NRC inspectors and your staff. In order to minimize the impact to your onsite resources and to ensure a productive inspection, we have enclosed a request for documents needed for this inspection. These documents have been divided into two groups. The first group (Section A of the enclosure) identified information to be provided prior to the inspection to ensure that the inspectors are adequately prepared. The second group (Section B of the enclosure) identifies the information the inspectors will need upon arrival at the site. It is important that all of these documents are up to date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection.

We have discussed the schedule for these inspection activities with your staff and understand that our regulatory contact for this inspection will be Mr. Steve Petzel of your licensing organization. The tentative inspection schedule is as follows:

Preparation week: October 13, 2014
Onsite weeks: October 20 – 31, 2014

Our inspection dates are subject to change based on your updated schedule of outage activities. If there are any questions about this inspection or the material requested, please contact the lead inspector Wayne Sifre at (817) 200-1193 (Wayne.Sifre@nrc.gov).

A.1 ISI/Welding Programs and Schedule Information

a) A detailed schedule (including preliminary dates) of:

i. Non-destructive examinations planned for ASME Code Class Components performed as part of your ASME Section XI, risk informed (if applicable), and augmented inservice inspection programs during the upcoming outage.

ii. Examinations planned for Alloy 82/182/600 components that are not included in the Section XI scope (If applicable)

iii. Examinations planned as part of your boric acid corrosion control program (Mode 3 walkdowns, bolted connection walkdowns, etc.)

iv. Welding activities that are scheduled to be completed during the upcoming outage (ASME Class 1, 2, or 3 structures, systems, or components)

b) A copy of ASME Section XI Code Relief Requests and associated NRC safety evaluations applicable to the examinations identified above.

i. A list of ASME Code Cases currently being used to include the system and/or component the Code Case is being applied to.

c) A list of non-destructive examination reports which have identified recordable or rejectable indications on any ASME Code Class components since the beginning of the last refueling outage. This should include the previous Section XI pressure test(s) conducted during start up and any evaluations associated with the results of the pressure tests.

d) A list including a brief description (e.g., system, code class, weld category, non-destructive examination performed) associated with the repair/replacement activities of any ASME Code Class component since the beginning of the last outage and/or planned this refueling outage.

e) If reactor vessel weld examinations required by the ASME Code are scheduled to occur during the upcoming outage, provide a detailed description of the welds to be examined and the extent of the planned examination. Please also provide reference numbers for applicable procedures that will be used to conduct these examinations.

f) Copy of any 10 CFR Part 21 reports applicable to structures, systems, or components within the scope of Section XI of the ASME Code that have been identified since the beginning of the last refueling outage.

g) A list of any temporary noncode repairs in service (e.g., pinhole leaks).

h) Please provide copies of the most recent self-assessments for the inservice inspection, welding, and Alloy 600 programs

A.2 Reactor Pressure Vessel Head

Documents requested under Inspection Procedure 71007, "Reactor Vessel Head Replacement Inspection."

A.3 Boric Acid Corrosion Control Program

a) Copy of the procedures that govern the scope, equipment and implementation of the inspections required to identify boric acid leakage and the procedures for boric acid leakage/corrosion evaluation.

b) Please provide a list of leaks (including code class of the components) that have been identified since the last refueling outage and associated corrective action documentation. If during the last cycle, the unit was shutdown, please provide documentation of containment walkdown inspections performed as part of the boric acid corrosion control program.

A.4 Steam Generator Tube Inspections

a) A detailed schedule of:

    i. Steam generator tube inspection, data analyses, and repair activities for the upcoming outage (if occurring).

    ii. Steam generator secondary side inspection activities for the upcoming outage (if occurring).

b) Copy of SG history documentation given to vendors performing eddy current (ET) testing of the SGs during the upcoming outage.

c) Copy of procedure containing screening criteria used for selecting tubes for in-situ pressure testing and the procedure to be used for in-situ pressure testing.

d) Copy of previous outage SG tube operational assessment completed following ET of the SGs. Also include a copy of the following documents as they become available:

    i. Degradation assessment

    ii. Condition monitoring assessment

e) Copy of the document defining the planned SG ET scope (e.g., 100 percent of unrepaired tubes with bobbin probe and 20 percent sample of hot leg expansion transition regions with rotating probe) and identify the scope expansion criteria, which will be applied. Also identify and describe any deviations in this scope or expansion criteria from the EPRI Guidelines.

f) Copy of the document describing the ET acquisition equipment to be applied including ET probe types. Also identify the extent of planned tube examination coverage with each probe type (e.g. rotating probe -0.080 inches, 0.115 inches pancake coils and mid-range +point coil applied at the top-of-tube-sheet plus 3 inches to minus 12 inches).

g) Identify and quantify any SG tube leakage experienced during the previous operating cycle. Also provide documentation identifying which SG was leaking and corrective actions completed and planned for this condition.

h) Copy of steam generator eddy current data analyst guidelines and site validated eddy current technique specification sheets. Additionally, please provide a copy of EPRI Appendix H, "Examination Technique Specification Sheets," qualification records.

i) Provide past history of the condition and issues pertaining to the secondary side of the steam generators (including items such as loose parts, fouling, top of tube sheet condition, crud removal amounts, etc.).

j) Indicate where the primary, secondary, and resolution analyses are scheduled to take place.

A.5 Additional Information Related to all Inservice Inspection Activities

a) A list with a brief description of inservice inspection, boric acid corrosion control program, and steam generator tube inspection related issues (e.g., condition reports) entered into your corrective action program since the beginning of the last refueling outage. For example, a list based upon data base searches using key words related to piping or steam generator tube degradation such as: inservice inspection, ASME Code, Section XI, non-destructive examination, cracks, wear, thinning, leakage, rust, corrosion, boric acid, or errors in piping/steam generator tube examinations.

b) Provide training (e.g. Scaffolding, Fall Protection, FME, Confined Space) if they are required for the activities described in A.1 through A.4.

c) Please provide names and phone numbers for the following program leads:

Inservice inspection (examination, planning)
Containment exams
Reactor pressure vessel head exams
Snubbers and supports
Repair and replacement program
Licensing
Site welding engineer
Boric acid corrosion control program
Steam generator inspection activities (site lead and vendor contact)

B. Information to be Provided Onsite to the Inspector(s) at the Entrance Meeting (October 20, 2014):

B.1 Inservice Inspection / Welding Programs and Schedule Information

a) Updated schedules for inservice inspection/non-destructive examination activities, including planned welding activities, and schedule showing contingency repair plans, if available.

b) For ASME Code Class welds selected by the inspector from the lists provided from section A of this enclosure, please provide copies of the following documentation for each subject weld:

   i. Weld data sheet (traveler).

   ii. Weld configuration and system location.

   iii. Applicable Code Edition and Addenda for weldment.

   iv. Applicable Code Edition and Addenda for welding procedures.

   v. Applicable welding procedures used to fabricate the welds.

   vi. Copies of procedure qualification records (PQRs) supporting the weld procedures from B.1.b.v.

   vii. Copies of welder's performance qualification records (WPQ).

   viii. Copies of the nonconformance reports for the selected welds (If applicable).

   ix. Radiographs of the selected welds and access to equipment to allow viewing radiographs (if radiographic testing was performed).

   x. Copies of the preservice examination records for the selected welds.

   xi. Readily accessible copies of non-destructive examination personnel qualifications records for reviewing.

c) For the inservice inspection related corrective action issues selected by the inspectors from section A of this enclosure, provide a copy of the corrective actions and supporting documentation.

d) For the non-destructive examination reports with relevant conditions on ASME Code Class components selected by the inspectors from Section A above, provide a copy of the examination records, examiner qualification records, and associated corrective action documents.

e) A copy of (or ready access to) most current revision of the inservice inspection program manual and plan for the current interval.

f) For the non-destructive examinations selected by the inspectors from section A of this enclosure, provide a copy of the non-destructive examination procedures used to perform the examinations (including calibration and flaw characterization/sizing procedures). For ultrasonic examination procedures qualified in accordance with ASME Code, Section XI, Appendix VIII, provide documentation supporting the procedure qualification (e.g. the EPRI performance demonstration qualification summary sheets). Also, include qualification documentation of the specific equipment to be used (e.g., ultrasonic unit, cables, and transducers including serial numbers) and non-destructive examination personnel qualification records.

B.2 Reactor Pressure Vessel Head (RPVH)

Documents requested under Inspection Procedure 71007, "Reactor Vessel Head Replacement Inspection."

B.3 Boric Acid Corrosion Control Program

a) Please provide boric acid walk down inspection results, an updated list of boric acid leaks identified so far this outage, associated corrective action documentation, and overall status of planned boric acid inspections.

b) Please provide any engineering evaluations completed for boric acid leaks identified since the end of the last refueling outage. Please include a status of corrective actions to repair and/or clean these boric acid leaks. Please identify specifically which known leaks, if any, have remained in service or will remain in service as active leaks.

B.4 Steam Generator Tube Inspections

a) Copies of the Examination Technique Specification Sheets and associated justification for any revisions.

b) Please provide a copy of the eddy current testing procedures used to perform the steam generator tube inspections (specifically calibration and flaw characterization/sizing procedures, etc.).

c) Copy of the guidance to be followed if a loose part or foreign material is identified in the steam generators.

d) Identify the types of SG tube repair processes which will be implemented for defective SG tubes (including any NRC reviews/evaluations/approvals of this repair process). Provide the flaw depth sizing criteria to be applied for ET indications identified in the SG tubes.

e) Copy of documents describing actions to be taken if a new SG tube degradation mechanism is identified.

f) Provide procedures with guidance/instructions for identifying (e.g. physically locating the tubes that require plugging) and plugging SG tubes.

g) List of corrective action documents generated by the vendor and/or site with respect to steam generator inspection activities.

B.5 Codes and Standards

a) Ready access to (i.e., copies provided to the inspector(s) for use during the inspection at the onsite inspection location, or room number and location where available):

    i. Applicable Editions of the ASME Code (Sections V, IX, and XI) for the inservice inspection program and the repair/replacement program.

ii. EPRI and industry standards referenced in the procedures used to perform the steam generator tube eddy current examination.

b) Copy of the performance demonstration initiative (PDI) generic procedures with the latest applicable revisions that support site qualified ultrasonic examinations of piping welds and components (e.g., PDI-UT-1, PDI-UT-2, PDI-UT-3, PDI-UT-10, etc.).

c) EPRI and industry standard references in the site procedures used to perform the SG tube eddy current examination, which includes EPRI documents: TR-107621-R1, "Steam Generator Integrity Assessment Guidelines," TR-107620-R1, "Steam Generator In-Situ Pressure Test Guidelines," Steam Generator Management Program: Steam Generator Integrity Assessment Guidelines, Part 10, and 1003138, "Pressurized Water Reactor Steam Generator Examination Guidelines."

d) Boric Acid Corrosion Guidebook Revision 1 – EPRI Technical Report 1000975.