UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

January 26, 2011

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

Subject: CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2010005

Dear Mr. Heflin:

On December 31, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. The enclosed integrated inspection report documents the inspection findings, which were discussed on December 29, 2010, with Mr. Fadi Diya, Vice President Nuclear Operations, and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified violations and one self-revealing violation of very low safety significance (Green). All three of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the violations or the significance of the noncited violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Boulevard, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Callaway Plant facility. In addition, if you disagree with the crosscutting aspect assigned to any finding 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 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 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).

Sincerely,

/RA/

Don Allen, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

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NRC Inspection Report 05000483/2010005
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000483
License:	NPF-30
Report:	05000483/2010005
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, MO
Dates:	September 24 through December 31, 2010
Inspectors:	D. Dumbacher, Senior Resident Inspector J. Groom, Resident Inspector G. Apger, Operations Engineer D. Graves, Health Physicist P. Elkmann, Senior Emergency Preparedness Inspector L. Ricketson, P.E., Senior Health Physicist J.Rotton, Resident Inspector, Arkansas Nuclear One
Approved By:	Don Allen, Chief, Project Branch B Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000483/2010005; 09/24/10 - 12/31/10; Callaway Plant, Integrated Resident and Regional Report; operability evaluations and identification and resolution of problems.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspection by region-based inspectors. Three Green noncited violations of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for failure to follow Procedure APA-ZZ-00500, Appendix 1, "Operability and Functionality Determinations." On the morning of September 23, 2010, Callaway engineering was informed that a concern existed that the safety related portion of the component cooling water system safety function could be affected by a guillotine break at the nonsafety/nonseismic boundary for supply and return piping to the radwaste building. The inspectors determined that the licensee staff did not engage the shift manager early enough and the shift manager did not adequately challenge the basis describing the nonconforming condition as acceptable. The shift manager allowed the component cooling water system to be in an indeterminate state of operability for over two hours without putting compensatory measures in place as described in Procedure APA-ZZ-00500, Appendix 1. This issue was entered into the licensee's corrective action program as Callaway Action Request 201010739.

  This finding was determined to be greater than minor because it impacted the Mitigating Systems Cornerstone attribute of human performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," this issue screened as requiring a Phase 3 analysis. The NRC senior risk analyst determined that because ΔCDF was less than 1E-6 and ΔLERF was not a significant contributor to risk, this finding was of very low safety significance, Green. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions when performing operability evaluations [H.1(b)](Section 1R15).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," associated with the licensee's failure to promptly identify and correct a boric acid leak on the containment spray system, a condition adverse to quality. During a plant walkdown on October 14, 2010, the inspectors noted the continued existence of a boric acid leak on the flow element above the discharge of the train A containment spray pump. Further inspection revealed the leak was first identified on February 16, 2009. The inspectors found that nearly twenty months after initial identification, the repair plan for the leak had not been assigned a scheduled date. Immediate corrective action planned was to complete the pipe stress analysis and repair the leak on-line in early January 2011.The failure to promptly correct the leak was directly caused by a lack of coordination between the engineering and outage planning departments. This issue was entered into the licensee's corrective action program as Callaway Action Request 201010263.

  This finding is more than minor because, if left uncorrected, programmatic work control and corrective action deficiencies would have the potential to lead to a more significant safety concern. This finding affected the Mitigating Systems cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because the degraded condition did not result in a loss of operability or functionality. The inspectors determined that the finding has a crosscutting aspect in the area of human performance because the licensee work practices did not ensure supervisory and management oversight of work activities, such that nuclear safety was supported [H.4(c)](Section 4OA2).

- Green. The inspectors identified a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to follow the requirements of Callaway Procedure APA-ZZ-00500, "Corrective Action Program," associated with a degraded train B emergency diesel generator jacket water keep warm pump. On November 6, 2010, the supply breaker to the train B emergency diesel generator jacket water keep warm pump tripped unexpectedly causing the engine to become inoperable. During follow-up investigation, the inspectors found that a March 31, 2009 motor circuit evaluation was performed that showed a step decrease in insulation resistance from 10,250 Mega-ohms to 3.5 Mega-ohms. The degradation was at a sufficient rate such that there was a reasonable doubt the motor would continue to be reliable until the next performance of the motor circuit evaluation. The licensee failed to recognize this degradation and, as a result, did not initiate a Callaway action request to evaluate the condition. This issue was entered into the licensee's corrective action program as Callaway Action Request 201010654.

  This finding is greater than minor because if left uncorrected, the failure to fully utilize the corrective action program could become a more significant safety concern. The inspectors determined that this finding impacted the Mitigating Systems cornerstone. Using Manual Chapter 0609.04, "Phase 1 – Initial

Screening and Characterization of Findings," the issue screened as having very low safety significance because it was not a design or qualification deficiency that did not result in a loss of operability or functionality, did not create a loss of system safety function of a single train for greater than the technical specification allowed outage times, and did not affect seismic, flooding, or severe weather initiating events. The inspectors determined that the finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because licensee personnel failed to implement the corrective action program with a low threshold for identifying issues [P.1(a)](Section 4OA2).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

The Callaway Plant was operated near 100 percent for the entire inspection period. The licensee, AmerenUE, changed the operating name to Ameren Missouri in October 2010.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of the adverse weather procedures for seasonal extremes (e.g., extreme low temperatures). The inspectors verified that weather-related equipment deficiencies identified during the previous year were corrected prior to the onset of seasonal extremes, and evaluated the implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of, and during, the adverse weather conditions.

During the inspection, the inspectors focused on plant-specific design features and the procedures used by plant personnel to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Final Safety Analysis Report and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. The inspectors also reviewed corrective action program items to verify that plant personnel were identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- November 8, 2010, Control room ventilation (GK)
- December 23, 2010, Essential service water pump room ventilation

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one readiness for seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- October 6, 2010, Class 1E electrical equipment air conditioning units SGK05A/B
- December 22, 2010, Inverters NN11, NN13 and NN14 during corrective maintenance to inverter NN12
- December 28, 2010, Train A charging system (BG) outside of containment

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Final Safety Analysis Report, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On November 8 through December 17, 2010, the inspectors performed a complete system alignment inspection of the main feedwater system to verify the functional capability of the system. The inspectors selected this system because it was considered

risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment lineups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- September 29, 2010, Area A-3, Rooms 1116 and 1117, Boric acid injection tank rooms
- October 19, 2010, Area A-4, Rooms 1107-1110, Combined safety injection, charging and containment spray pump rooms
- October 19, 2010, Area A-25, Room 1322, Containment isolation valve train B (south) room
- October 19, 2010, Area A -23, Rooms 1508, 1509, 1411 and 1412, Main steam and feedwater valve compartment rooms
- December 8, 2010, Area C-1, Room 3415, Class 1E air conditioning room

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire

protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- October 1, 2010, Room 3101, Essential service water pipe chase
- October 25, 2010, Review of nearby nonsafety related cable vault inspections to assess the safety related essential service water cable vaults, Jobs 10007468 and 10005855
- December 15, 2010, Room 1126, Boron injection tank room

These activities constitute completion of two flood protection measures inspection samples and one bunker/manhole sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Quarterly Review

a. Inspection Scope

On November 19, 2010, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas with respect to the loss of secondary heat sink (FRH-1) scenario:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to preestablished operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

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 Annual Inspection

a. Inspection Scope

The inspectors reviewed the annual operating test results for 2010. Since this was the first half of the biennial requalification cycle, the licensee was not required to administer a written examination. These results were assessed to determine if they were consistent with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," guidance and Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process," thresholds. This review included the test results for a total of 9 crews composed of 26 senior reactor operators and 26 reactor operators. All individuals and crews passed all portions of the operating test.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- November 23, 2010, Callaway Action Request 201004344, Pressurizer power operated relief valve block valve BBHV8000A
- December 6, 2010, Review of licensee's 10 CFR 50.65 (a)(3) periodic evaluation

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)

- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- September 28, 2010, Planned risk associated with isolation of offsite switchyard feed from the Montgomery – Cal substation

- October 27, 2010, Planned risk associated with train B essential service water and ultimate heat sink work window

- November 2, 2010, Planned risk associated with train A component cooling water system work window

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk

analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- October 18, 2010, Callaway Action Request 201009108, Past operability review of seismic design of component cooling water supply to the radwaste system
- November 22, 2010, Callaway Action Request 201009424, operability review of single failure classification of check valve EM8815
- November 26, 2010, Callaway Action Request 201010145, operability review of non-seismic piping connecting to refueling water storage tank piping
- December 1, 2010, Callaway Action Request 201009024, operability review associated with past failures of non-technical specification switchgear for air conditioning unit SGK05

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Final Safety Analysis Report to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

Introduction. The NRC identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures and Drawings,” for failure to follow Procedure APA-ZZ-00500, Appendix 1, “Operability and Functionality Determinations.”

Description. On September 23, 2010, the inspectors identified a failure to perform an adequate operability determination in accordance with licensee Procedure APA-ZZ-00500, Appendix 1. Engineering was informed during the morning of September 23, 2010, that a concern existed that the safety related portion of the component cooling water (CCW) system safety function could be affected by a guillotine break at the nonsafety/nonseismic boundary for supply and return piping to the radwaste building. This was documented in Callaway Action Request 201009108 and provided to the operations shift manager. It stated that calculation M-EG-12-C was performed to determine break flow rate and water volume and ensure adequate net positive suction head for the CCW pumps. The result of the calculation was that 1867 gallons of water would be lost from the CCW surge tank leaving 695 gallons in the tank and 6.7 feet of head margin to net positive suction head required. The calculation and the Callaway action request determined that a positive pressure from the surge tank would prevent air intrusion to the CCW pump suction lines. The evaluation did not recognize that the surge tank outlet pipe was of significantly smaller (4-inch versus 12-inch) diameter than that of the break size and thus would not be able to prevent air intrusion or low CCW pump suction pressures prior to auto isolation of the postulated break. The inspectors questioned the Callaway action request and the shift manager on his initial operability decision at 3:38 p.m., hours after engineering knew of the seismic design concern. After the resident inspectors communicated the challenge, the licensee recognized the analysis could not support operability and at 6:02 p.m. isolated the postulated seismic break flow path.

The NRC resident inspectors reviewed Callaway Action Request 201009108 and associated Procedures APA-ZZ-00500, Appendix 1, "Operability and Functionality Determinations," and ODP-ZZ-00001, Addendum 15, "Performance of Operability and Functionality Determinations." Per Procedure ODP-ZZ-00001, Step 3.2.2, “The Shift Manager should ENSURE an appropriate level of questioning and challenging of assumptions occurs to ensure that a sound basis for operability exists throughout the OD process.” Procedure APA-ZZ-00500, Appendix 1, Step 3.1.3 stated “the shift manager is responsible to: Immediately DECLARE equipment inoperable when reasonable expectation of operability does NOT exist or mounting evidence suggests that the final analysis will conclude that the equipment can NOT perform its specified safety function(s).” The procedure stated in the 4.0 Notes box that: “An SSC described in the Technical Specifications is either operable or inoperable at all times. "Indeterminate" is NOT a recognized state of operability.” Step 4.1.1 stated that a shift manager’s review of a nonconforming or degraded condition should consider: “Whether there is a reasonable expectation of operability, including the basis for the determination and whether any compensatory measures are necessary to enhance, establish, or restore operability.”

The inspectors determined that the licensee staff did not engage the shift manager early enough. The engineering calculation referenced in the Callaway action request did not directly address the problem identified and failed to consider the smaller 4-inch pipe exiting the CCW surge tank. The shift manager did not adequately challenge the original Callaway action request basis describing the nonconforming condition as acceptable. The shift manager allowed the CCW system to be in an indeterminate state of operability for over two hours without putting compensatory measures in place as described in Procedure APA-ZZ-00500, Appendix 1. The operations department Procedure ODP-ZZ-00001, Addendum 15, has been loosely interpreted to suggest that reasonable assurance can be delayed through a review process trying to develop a basis for operability versus recognizing that reasonable assurance is not immediately obvious. In this case, required compensatory measures were necessary since a prompt operability determination could not support operability without the measures. Long term corrective actions were initiated by the licensee to develop a modification to address the possible seismic break.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to follow procedures associated with operability and functionality determinations. This finding was determined to be greater than minor because it impacted the Mitigating Systems Cornerstone attribute of human performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," this issue required a Phase 3 significance determination because the finding was potentially risk significant for external events. The NRC senior risk analyst determined:

> This finding affected the Mitigating Systems Cornerstone because seismic protection was degraded. The finding represented the degradation of equipment and functions specifically designed to mitigate a seismic event and that during an earthquake the deficiency would degrade one train of component cooling water, a system that supports a safety system or function. Therefore, the finding was potentially risk significant to seismic initiators and a Phase 3 analysis was required. This finding was not related to other internal or external initiating events.

The licensee failed to adequately analyze the interface between the safety-related and nonsafety-related portions of the CCW system. Specifically, the inspectors determined that the current design calculation did not ensure the continued operability of the affected CCW train in the event of a failure in the non-safety related portion of the system. As a result, the affected CCW pumps could be subject to reduced suction pressure, cavitation, and potential air ingestion. Specifically, the design basis analysis did not ensure that the affected train of CCW would perform its required functions after the failure of non-safety related CCW piping. Also, the inspectors determined that the finding was similar to Examples 3.j and 3.k of MC 0612, Appendix E, in that there was a reasonable doubt of the operability of the component based on the existing analyses.

Phase 3 Evaluation for External Events

A Region IV senior reactor analyst performed a Phase 3 significance determination. The analyst determined that a seismic event sufficient to cause a loss of offsite power was necessary to cause a failure of the nonsafety-related piping. The dominant core damage sequences included a loss of one train of component cooling water combined with the loss of the opposite emergency diesel generator train. The significance was mitigated by the turbine-driven auxiliary feedwater pump and the low frequency of seismic induced loss of offsite power events for Callaway. The ΔCDF for Callaway was 1.55E-7/year.

Risk Contribution from Large Early Release Frequency (LERF)

Using IMC 0609, Appendix H, the senior reactor analyst determined that this was a Type A finding (i.e., LERF contributor) for a large dry containment. For pressurized water reactor plants with large dry containments, only findings related to accident categories intersystem loss of coolant accidents or steam generator tube ruptures have the potential to impact LERF. In addition, an important insight from the individual plant examination program and other probabilistic risk assessments is that the conditional probability of early containment failure is less than 0.1 for core damage scenarios that leave the reactor coolant system at high pressure (>250 psi) at the time of reactor vessel breach. Since this finding is not related to intersystem loss of coolant accidents or steam generator tube ruptures, and the dominant core damage scenarios for this finding leave the reactor coolant system at high pressure, the analysts concluded that LERF was not a significant contributor to the risk associated with this finding.

Since the ΔCDF was less than 1E-6 and the ΔLERF was not a significant contributor to risk, this finding was of very low safety significance, Green.

This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions when performing operability evaluations [H.1(b)].

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," specifies that activities affecting quality shall 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, or drawings. Contrary to the above, on September 23, 2010, Callaway plant operators failed to adequately perform activities affecting quality in accordance with procedures appropriate to the circumstances. Specifically, Callaway Plant operators failed to establish there was a reasonable expectation of operability of structures, systems, and components following identification of a nonconforming condition in accordance with Step 3.1.3 of Procedure APA-ZZ-00500, Appendix 1, "Operability and Functionality Determinations." Because of the very low safety significance and Ameren Missouri's action to place this issue in their corrective action program as Callaway Action Request 201010739, this violation is being treated as a

noncited violation in accordance with Section 2.3.2.a of the Enforcement Policy: NCV 05000483/2010005-01, “Failure to Follow Operability Determination Procedure.”

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- October 13, 2010, Postmaintenance test of emergency boration valve BGV-8104, Job 10511563
- November 1, 2010, Postmaintenance test of the control building pressure boundary following modification work that bored holes in the boundary wall, Job 10006320
- December 16, 2010, Postmaintenance test of refueling water storage tank valve BNHV8812B, Jobs 08006355 and 10514110

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following:

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Test data
- Testing frequency and method demonstrated technical specification operability
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- October 26, 2010, Routine surveillance of train B emergency diesel generator, Job 10514551
- November 15, 2010, Reactor coolant system leakage surveillance following repair to BG system letdown line weld leak at BGV002
- December 8, 2010, Routine surveillance of train A emergency diesel generator, Job 10516166

- December 27, 2010, Routine inservice test surveillance of train A containment spray pump, Job 10513458.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three routine surveillance testing inspection samples and one reactor coolant system leakage sample as defined in Inspection Procedure 71111.22-05.

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 37, and Procedure EIP-ZZ-00101, Addendum 1, "Emergency Action Level Classification Matrix," Revision 2, and Procedure EIP-ZZ 00101, Addendum 2, "Emergency Action Level Technical Bases Document," Revision 4. These revisions:

- Reduced the wind speed threshold in emergency action levels HU1.2 and HA1.2, tornado or high winds striking within protected area boundary, from >100 miles/hour to ≥74 miles/hour

- Replaced references to Final Safety Analysis Report, Section 3.3.1.1, "Design Wind Velocity," with references to the Saffir-Simpson Scale in the technical bases for emergency action levels HU1.2 and HA1.2

- Revised the Technical Support Center reference diagram

- Clarified the periodicity of emergency preparedness audits

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, to the Nuclear Energy Institute Report 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, 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). This review was not documented in a safety evaluation report and did not constitute approval of the licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of three samples as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS04 Occupational Dose Assessment (71124.04)

a. Inspection Scope

This area was inspected to: (1) determine the accuracy and operability of personal monitoring equipment; (2) determine the accuracy and effectiveness of the licensee's methods for determining total effective dose equivalent; and (3) ensure occupational dose is appropriately monitored. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel, performed walkdowns of various portions of the plant, and reviewed the following items:

- External dosimetry accreditation, storage, issue, use, and processing of active and passive dosimeters
- The technical competency and adequacy of the licensee's internal dosimetry program
- Adequacy of the dosimetry program for special dosimetry situations such as declared pregnant workers, multiple dosimetry placement, and neutron dose assessment
- Audits, self-assessments, and corrective action documents related to dose assessment since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.04-05.

b. Findings

No findings were identified.

2RS05 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

This area was inspected to verify the licensee is assuring the accuracy and operability of radiation monitoring instruments that are used to: (1) monitor areas, materials, and workers to ensure a radiologically safe work environment; and (2) detect and quantify radioactive process streams and effluent releases. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel, performed walkdowns of various portions of the plant, and reviewed the following items:

- Selected plant configurations and alignments of process, postaccident, and effluent monitors with descriptions in the Final Safety Analysis Report and the offsite dose calculation manual

- Select instrumentation, including effluent monitoring instrument, portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors to examine their configurations and source checks

- Calibration and testing of process and effluent monitors, laboratory instrumentation, whole body counters, postaccident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, continuous air monitors

- Audits, self-assessments, and corrective action documents related to radiation monitoring instrumentation since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.05-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the third quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - high pressure injection systems performance indicator for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index high pressure injection system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Residual Heat Removal System (MS09)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - residual heat removal system performance indicator for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index residual heat removal system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrence reviews; and the classification, prioritization, focus, and timeliness

of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this thorough review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of July 1, 2010, through December 31, 2010, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with

a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of a single semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

The inspectors found that the licensee did identify the following trends of significance:

- Callaway Action Request 201006190, potential trend in radiation worker practices
- Callaway Action Request 201009145, potential knowledge gap in application of plant licensing and design basis
- Callaway Action Request 201011689, adverse trend of in-plant human performance errors

The resident inspectors concurred with these items as being noteworthy trends needing additional corrective actions. Additionally, the inspectors noted adverse trends in:

- Difficulties in submitting timely and accurate reports to the NRC as required by 10 CFR 50.59, 10 CFR 50.73 and Reactor Oversight Process performance indicator program
- Declining performance in the preparation of operability determinations. See noncited violations 0500483/2009005-02, 05000483/2010002-01 and 05000483/2010005-01

No findings were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting:

- Assumptions used in the inadvertent safety injection accident analysis, Callaway Action Request 201009582
- Boric acid leak on train A containment spray piping not yet scheduled for repair, Callaway Action Request 200901326
- Wall thinning pits discovered on 8-inch essential service water piping in Room 1204, Callaway Action Request 201009582

- Failure of train B emergency diesel generator keep warm pump, Callaway Action Request 201010533

These activities constitute completion of four in-depth problem identification and resolution samples as defined in Inspection Procedure 71152-05.

b. Findings

1. Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," associated with the licensee's failure to promptly identify and correct a boric acid leak on the containment spray system, a condition adverse to quality.

Description. During a plant walkdown on October 14, 2010, the inspectors noted the continued existence of a boric acid leak on the flow element above the discharge of the train A containment spray pump. Further inspection revealed the following timeline:

- February 2008 - The resident inspectors noted that the containment spray system trains had each been decoupled to allow performance of pump discharge piping modification. The modification required a similar pipe stress analysis to that required for Job 09001208.

- November 2008 - Callaway Action Request 200810705, a Level 2 significance condition adverse to quality corrective action document with a full causal analysis had noted that: boric acid leak jobs are not being completed within the time requirements established in the leak management program resulting in a less than desirable material condition for the affected equipment.

- February 16, 2009 - The leak was first identified at flow element ENFE0005. Corrective action document Callaway Action Request 200901326 and Job 09001208 were immediately created to track and repair the leakage.

- March 16, 2009 - Callaway Action Request 200901326 was closed to the aforementioned job.

- May 4, 2009 - Another corrective action document, Callaway Action Request 200903641, was initiated by operators to again identify the leakage. It was closed to previously closed Callaway Action Request 200901326.

- May 6, 2009 - Analysis of the job required either a pipe stress analysis evaluation to document acceptability or performance of the job in the April 2010 refueling outage.

- May 22, 2009 - The job was coded as R00 meaning it was not assigned a due date or a particular refueling outage.

- May 26, 2009 - Additional boric acid buildup necessitated that the flange be cleaned.

- July 13, 2009 - The quality control group noted leakage during a VT-2 inspection and initiated a third corrective action document Callaway Action Request 200905530 which was also closed to the original closed Callaway Action Request 200901326.

- August 10, 2009 - Due to inaction by engineering to perform stress analysis and work control to schedule the repair, Job 09001208 was designated too late for Refueling Outage 17 in April 2010 and thus was reassigned to Refueling Outage 18 due to start in October 2011.

- September 1, 2009 - The Refueling Outage 18 (October 2011) outage team rejected the job stating it needed to perform the pipe stress analysis to allow it to be performed online. The request for the pipe stress analysis had been coded as "discretionary" meaning very low priority.

- September 15, 2009 - Seven months after the adverse condition was identified, the licensee engineering department added a note to the job stating the department no longer had anyone trained to perform the required stress analysis.

- October 14, 2010 - Twenty months after initial identification, the repair plan for the leak was challenged by the resident inspectors. The job to repair the flow element flange leak still had not been assigned a scheduled due date.

It is evident by the timeline that the licensee's work control and engineering groups failed to work together to ensure a condition adverse to quality was addressed. Immediate corrective action planned as of November 8, 2010, was to complete the pipe stress analysis and repair the leak on-line in early January 2011.

Analysis. The performance deficiencies associated with this finding involved the licensee's failure to implement prompt corrective actions for an adverse condition. Specifically, the licensee failed to correct the adverse condition associated with a boric acid leak on the containment spray system. This finding is more than minor because, if left uncorrected, programmatic work control and corrective action deficiencies would have the potential to lead to a more significant safety concern. This finding affected the Mitigating Systems cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because the degraded condition did not result in a loss of operability or functionality. The inspectors determined that the finding has a crosscutting aspect in the area of human performance because the licensee work practices did not ensure supervisory and management oversight of work activities, such that nuclear safety was supported [H.4(c)].

Enforcement. Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure conditions adverse to quality are promptly identified and corrected. Contrary to

the above, the licensee failed to implement adequate timely corrective actions for the identified adverse condition of boric acid leakage at the containment spray flow element ENFE0005. Specifically, the licensee failed to promptly perform corrective actions prescribed in Callaway Action Request 200901326. Because this violation is of very low safety significance and has been entered into the licensee's corrective action program as Callaway Action Request 201010263, this violation is being treated as a noncited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2010005-02, "Inadequate, Untimely Corrective Actions for a Containment Spray System Condition Adverse to Quality."

2. Introduction. The inspectors identified a self-revealing Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to follow the requirements of Callaway Procedure APA-ZZ-00500, "Corrective Action Program," associated with a degraded emergency diesel generator train B jacket water keep warm pump.

   Description. On November 6, 2010, the supply breaker to the emergency diesel generator train B jacket water keep warm pump tripped unexpectedly while the pump was running. Approximately an hour after the trip of the keep warm pump, the licensee received a low jacket water temperature alarm and entered Technical Specification Limiting Condition for Operation 3.8.1, "AC Sources," Condition B, for one inoperable diesel generator. Troubleshooting conducted under Job 10008475, by the licensee, found indications that the motor was faulted to ground and the breaker tripped on overcurrent. Following troubleshooting, the licensee replaced the faulted motor for the jacket water keep warm pump, restored jacket water temperature, and exited the technical specification for emergency diesel generator train B. The unexpected trip of the jacket water keep warm pump was documented in Callaway Action Request 201010530.

   During follow-up investigation, the work history for emergency diesel generator train B jacket water keep warm pump was reviewed. The pump and motor had been installed in March 2005 under Job C711091. Following installation, no postmaintenance motor circuit evaluation testing was performed to establish baseline motor stator resistance to ground. The first motor circuit evaluation was performed on May 16, 2006, under Job P716660 and indicated a satisfactory motor stator resistance to ground of 10,250 Mega-ohms. Since the preventive maintenance task to check motor insulation resistance has a frequency of 36 months, the next check occurred on March 31, 2009, under Job 06524404. That motor circuit evaluation showed a step decrease in insulation resistance from 10,250 Mega-ohms to 3.5 Mega-ohms. While the insulation resistance reading taken on March 31, 2009, did not result in a condition that would immediately challenge the ability of the pump to function, the step decrease in insulation resistance did indicate a significant degradation in the motor stator insulation. The degradation was at a sufficient rate such that there was a reasonable doubt the motor would continue to be reliable until the next performance of the motor circuit evaluation. The licensee failed to recognize this degradation and as a result, did not initiate a Callaway action request to evaluate the condition.

The inspectors reviewed Job 06524404 and noted that the step change in the jacket water keep warm pump's motor insulation resistance met the requirements specified in Procedure APA-ZZ-00500, "Corrective Action Program," for entry into the corrective action program. Specifically, Section 4.1 required that a Callaway action request be generated for a condition that could credibly impact nuclear safety, radiological safety, personnel safety, or plant reliability. The inspectors also noted that the licensee missed an opportunity to identify the degradation in the emergency diesel generator train B jacket water keep warm pump following an unexpected pump trip during Refuel 17 in June 2010. The cause of that pump trip was never evaluated and a motor circuit evaluation was never performed because the breaker was successfully reclosed during troubleshooting.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to follow the requirements of Callaway Procedure APA-ZZ-00500, "Corrective Action Program." Specifically, licensee personnel failed to initiate a Callaway action request for an adverse condition found during the March 31, 2009, motor circuit evaluation of the emergency diesel generator train B jacket water keep warm pump. This finding is greater than minor because if left uncorrected, the failure to fully utilize the corrective action program could become a more significant safety concern. The inspectors determined that this finding impacted the Mitigating Systems Cornerstone. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as having very low safety significance because it was not a design or qualification deficiency that did not result in a loss of operability or functionality, did not create a loss of system safety function of a single train for greater than the technical specification allowed outage times, and did not affect seismic, flooding, or severe weather initiating events. The inspectors determined that the finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because licensee personnel failed to implement the corrective action program with a low threshold for identifying issues [P.1(a)].

Enforcement. 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 shall be prescribed by documented instructions or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions or drawings. Contrary to the above, on March 31, 2009, the licensee failed to enter the adverse condition of degrading jacket water pump motor insulation resistance into their corrective action program as required by Section 4.1 of Procedure APA-ZZ-00500, "Corrective Action Program," Revision 47, that stated a Callaway action request be generated for a condition that could credibly impact nuclear safety, radiological safety, personnel safety, or plant reliability. Because of the very low safety significance of this finding and because the licensee has entered this issue into their corrective action program as Callaway Action Request 201010654, this violation is being treated as a noncited violation in accordance with Section 2.3.2.a of the Enforcement Policy: NCV 05000483/2010005-03, "Failure to Enter Condition Adverse to Quality Associated with Emergency Diesel Generator Jacket Water Keep Warm Pump into the Corrective Action Program."

4OA3 Event Follow-up (71153)

.1 (Closed) Licensee Event Report 05000483/2009-005-01, Atmospheric Steam Dump Valves Inoperable for Time Greater than Allowed by Technical Specifications

a. Inspection Scope

On December 8, 2009, atmospheric steam dump valve ABPV0003 was taken out of service for calibration of the pressure transmitter and controller. Postmaintenance testing revealed the valve would not stroke full open or control in manual. The positioner diaphragm pressure gauge port was blown out to ensure it was not blocked. After postmaintenance testing, the valve was declared operable on December 11, 2009. The other three atmospheric steam dumps were stroke tested as an extent of condition test. Two of them performed satisfactorily. However, valve ABPV0002 did not stroke full open as required, and was declared inoperable. Troubleshooting for valve ABPV0002 revealed the current-to-pressure transducer was erratic and actuator leakage was in excess of the allowable rate. The current-to-pressure transducer and diaphragm were replaced. Following completion of postmaintenance testing, the valve was declared operable. Subsequent review by the licensee determined that valve ABPV0002 was inoperable for a time longer than permitted by Technical Specification 3.7.4. and was determined to be reportable as a condition prohibited by the plant's technical specifications. The enforcement aspects of the violation are discussed in Inspection Report 05000483/2010004. Revision 1 was submitted to document that the event did represent a condition that could have prevented fulfillment of a safety function of a system needed to remove residual heat and mitigate the consequences of an accident and was therefore reportable per the requirements of 10 CFR 50.73(a)(2)(v)(B) and 10 CFR 50.73(a)(2)(v)(D). The inspectors reviewed the licensee's submittal and determined that the report adequately documented the summary of the event including the potential safety consequences and corrective actions required to address the performance deficiency. This licensee event report is closed.

.2 (Closed) Licensee Event Report 2010-007-00, Violation of Technical Specification 3.6.3, "Containment Isolation Valves"

On August 10, 2010, during performance of a surveillance test, component cooling water return containment outer isolation valve EGHV0059 failed to stroke full closed from the control room. The licensee declared the valve inoperable and entered Technical Specification 3.6.3, Action A.1, which required the licensee to isolate the affected penetration flow path by use of at least one closed and deactivated automatic valve within four hours. The licensee verified valve EGHV0059 shut and deactivated to meet the requirements of Technical Specification 3.6.3. The penetration flow path was unisolated under administrative controls by opening valve EGHV0131, the bypass around EGHV0059. Since EGHV0131 does not receive an automatic containment isolation signal, a dedicated on-shift operations technician was stationed in the auxiliary building. Subsequent review by the NRC resident inspectors identified that the licensee's administrative controls to comply with Technical Specification 3.6.3 were inadequate since the technical specification bases required administrative controls to consist of a dedicated operator at the valve controls in continuous communication with

the control room. Subsequent review by the licensee determined that the containment penetration flow path was inoperable for a time longer than permitted by Technical Specification 3.6.3 and was determined to be reportable as a condition prohibited by the plant's technical specifications. The inspectors reviewed the licensee's submittal and determined that the report adequately documented the summary of the event including the potential safety consequences and corrective actions required to address the performance deficiency. The inspectors had previously identified a noncited violation of Technical Specification 3.6.3, "Containment Isolation Valves." The enforcement aspects of the violation are discussed in Section 1R15 of Inspection Report 05000483/2010004. No additional violations were identified during the inspectors' review. This licensee event report is closed.

4OA6 Meetings

Exit Meeting Summaries

On September 24, 2010, the inspectors presented the results of the radiation safety inspections to Mr. A. Heflin, Senior Vice President and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified. A teleconference was conducted with Mr. S. Petzel, Engineer, Regulatory Affairs, and members of the radiation protection staff on October 13, 2010, to discuss information which was not available at the exit meeting. The additional information did not result in a finding.

On November 4, 2010, the inspectors discussed the inspection results of the licensed operator requalification program annual operating test with Mr. L. Wilhelm, Operating Supervisor, in operations training. The licensee acknowledged the results. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On November 30, 2010, the emergency preparedness inspector discussed the results of the in-office inspection of licensee changes to their emergency plan and emergency plan implementing procedures with Mr. K. Bruckerhoff, Assistant Manager, Protective Services, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On December 29, 2010, the resident inspectors presented the inspection results to Mr. F. Diya, Vice President, Nuclear Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

Regulatory Performance Meeting Summary

On October 5, 2010, the Chief of Branch B of the Division of Reactor Projects conducted a regulatory performance meeting during a periodic management visit to the Callaway Plant with Mr. F. Diya, Vice President, Nuclear Operations. The licensee's performance deficiencies associated with a White performance indicator for the Mitigating System Performance Index – Emergency AC Power were discussed along with the licensee's corrective actions.

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

K. Bruckerhoff, Assistant Manager, Protective Services
F. Diya, Vice President, Nuclear Operations
C. Emerson, Supervisor, Radiation Protection
L. Franks, Systems Engineer, Nuclear Engineering
C. Graham, Staff Health Physicist, Radiation Protection
A. Heflin, Senior Vice President and Chief Nuclear Officer
S. Petzel, Engineer, Regulatory Affairs
A. Schnitz, Engineer, Regulatory Affairs
C. Smith, Acting Manager, Radiation Protection
D. Thompson, Staff Health Physicist, Radiation Protection
L. Wilhelm, Operating Supervisor

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2010005-01	NCV	Failure to Follow Operability Determination Procedure (Section 1R15)
05000483/2010005-02	NCV	Inadequate, Untimely Corrective Actions for a Containment Spray System Condition Adverse to Quality (Section 4OA2)
05000483/2010005-03	NCV	Failure to Enter Condition Adverse to Quality Associated with Emergency Diesel Generator Jacket Water Keep Warm Pump into the Corrective Action Program (Section 4OA2)

Closed

05000483/2009-005-01	LER	Atmospheric Steam Dump Valves Inoperable for Time Greater than Allowed by Technical Specifications
05000483/2010-007-00	LER	Violation of Technical Specification 3.6.3, “Containment Isolation Valves”

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

NUMBER	TITLE	REVISION
OTS-ZZ-00007	Plant Cold Weather	20

Section 1R04: Equipment Alignment

PROCEDURES

NUMBER	TITLE	REVISION
ITL-AE-0F510	SG A Feedwater Flow Control	20
ITL-AE-0F511	SG A Feedwater Flow Indication	8
ITL-AE-0F520	SG B Feedwater Flow Control	19
ITL-AE-0F521	SG B Feedwater Flow Indication	9
ITL-AE-0F530	SG C Feedwater Flow Control	20
ITL-AE-0F531	SG C Feedwater Flow Indication	9
ITL-AE-0F540	SG D Feedwater Flow Control	22
ITL-AE-0F541	SG D Feedwater Flow Indication	8
ITM-ZZ-VT001	Diagnostic Calibration and Testing of Modulating Air Operated Valves	12
OSP-AE-V0004	Main Feedwater Regulating Valve Inservice Test	6
OSP-AE-V0005	Main Feedwater Regulating Valve Bypass Test	7
OTN-NN-00002	120V Vital AC Instrument Power – Class 1E (Channel 2)	1

DRAWINGS

NUMBER	TITLE	REVISION
M-1175-00001	Feedwater Control Valve	5
M-22-AE01	Piping and Instrumentation Diagram Feedwater System	46
8756D37 S033	SNUPPS Process Control Block Diag. (SGLC)	12
M-22BG01(Q)	Piping and Instrumentation Diagram Chemical and Volume Control System	31
M-22BG02(Q)	Piping and Instrumentation Diagram Chemical and Volume Control System	27
M-22BG03(Q)	Piping and Instrumentation Diagram Chemical and Volume Control System	54
M-22BG04(Q)	Piping and Instrumentation Diagram Chemical and Volume Control System	21
M-22BG05(Q)	Piping and Instrumentation Diagram Chemical and Volume Control System	24

CALLAWAY ACTION REQUESTS

200812666	200901840	200901668	200812877

JOBS

08513222	09502780	08511969	09502813	08513223
08511970	08512576	05516897	09502814	08512929
08512582	09001404	09001407	09001408	09001409
08509080	09504845	08509495	09500436	08507980

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION / DATE
T61.0110 6/T61.016D	System Health Notes for AE – STM GEN FW system	October 26, 2010
B3.7.3	Main Feedwater System Descriptions	July 6, 2009
RFR 08932A	Technical Specification Bases for Main Feedwater Isolation Valves, Regulating Valves and Main Feedwater Regulating Valve Bypass Valves	8g
RFR 20508	Acceptance Criteria for OSP-NB-00001	A
RFR 20508	Acceptance Criteria for OSP-NB-00001	B

Section 1R05: Fire Protection

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	19
APA-ZZ-00741	Control of Combustible Materials	19
FPP-ZZ-00001	Auxiliary Building Prefire Strategies	22
FPP-ZZ-00004	Control Building and Communications Corridor Prefire Strategies	15
FPP-ZZ-00007	Miscellaneous Buildings Inside the Protected Area Prefire Strategies	12

Section 1R06: Flood Protection Measures

DRAWINGS

NUMBER	TITLE	REVISION
8600-X-88865	Ductbanks and Manholes Site Plan Area 6	19
A-2324	Architectural Control and Diesel Gen Buildings and Communication Corridor – Floor Plans @ EL 1974'-0" and El 1984'-0"	7
M-25EA01	Hanger Location Dwg. Service Water System Communication Corridor	1
M-25EA03	Hanger Location Dwg. Service Water System Auxiliary Bldg. and Comm. Corridor	2
M-25EF01(Q)	Hanger Location Dwg. Essential Service Water Control Bldg (A&B) Train	13
M-25KC04	Hanger Location Dwg. Fire Protection Control Building	11
M-25KC05	Hanger Location Dwg. Fire Protection Bldg., Diesel Bldg., & Comm. Corridor	13
M-25KC19	Hanger Location Dwg. Fire Protection Control Building	7

CALLAWAY ACTION REQUESTS

201010938 201010956

JOBS

100007468 10005855 9005826

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
Calculation XX-49	Control Building Flooding	0
Calculation M-FL-03	Flooding of Individual Aux Bldg Rooms	2

Calculation M-FL-06	Control Bldg Flooding	0
RFR 21046	Internal Flooding Evaluation for BIT Room	A

Section 1R11: Licensed Operator Requalification Program

PROCEDURES

NUMBER	TITLE	REVISION / DATE
E-0	Reactor Trip or Safety Injection	
EIP-ZZ-00101	Classification of Emergencies	
FR-H.1	Response to Loss of Secondary Heat Sink	

Section 1R12: Maintenance Effectiveness

CALLAWAY ACTION REQUESTS

200909313	201002567	201005654	201005656	201006147
201006149	201006789			

MISCELLANEOUS DOCUMENTS

TITLE	DATE
Maintenance Rule Periodic Assessment for Cycle 17	December 7, 2010

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

NUMBER	TITLE	REVISION
EDP-ZZ-01129	Callaway Plant Risk Assessment	17
EDP-ZZ-01129 Appendix 2	Risk Management Actions for Planned Risk-Significant Activities	16

Section 1R15: Operability Evaluations

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00500, Appendix 1	Operability and Functionality Determinations	11

DRAWINGS

NUMBER	TITLE	REVISION
M-22BN01(Q)	Piping and Instrumentation Diagram Borated Refueling Water Storage System	25
M-22EG01(Q)	Piping and Instrumentation Diagram Component Cooling Water System	9
M-22EG02(Q)	Piping and Instrumentation Diagram Component Cooling Water System	19
M-22EG03(Q)	Piping and Instrumentation Diagram Component Cooling Water System	22

CALLAWAY ACTION REQUESTS

200800615	201009424	201010145	201010739	201011132

Section 1R19: Postmaintenance Testing

PROCEDURES

NUMBER	TITLE	REVISION
OSP-GK-0002B	Train B Control Room Ventilation and Pressure Test	14

JOBS

10008582

Section 1R22: Surveillance Testing

PROCEDURES

NUMBER	TITLE	REVISION
ODP-ZZ-00029	RCS Leakage Action Level Guideline	1
OSP-EN-P0001A	Train A Containment Spray Pump Inservice Test	34
OSP-NE-0001B	Standby Diesel B Periodic Test	40
OSP-NE-0001A	Standby Diesel A Periodic Test	42

DRAWINGS

NUMBER	TITLE	REVISION
M-22BN01(Q)	Piping and Instrumentation Diagram Borated Refueling Water Storage System	25
M-22EN01(Q)	Piping and Instrumentation Diagram Containment Spray System	15

CALLAWAY ACTION REQUESTS

201011340	201010669	201010352	201010618

JOBS

10514551	10516166	10513458

Section 2RS04: Occupational Dose Assessment

PROCEDURES

NUMBER	TITLE	REVISION
HDP-ZZ-1300	Internal Dose Program	28
HDP-ZZ-1301	Whole Body Counting Quality Control Program	9

HTP-ZZ-1302	Response to Positive Termination In Vivo Count	12
HDM-ZZ-1300	Internal Dose Assessment Guidelines	0
RP-DTI-EXTDOS QC	Primary Monitoring Device Quality Control	4

CALLAWAY ACTION REQUESTS

201003778	201004387	201004429	201004443	201004694
201005412	201006977			

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
H230.0040	Independent Offsite Irradiation Results	August 5, 2010
HPCI-0810	In Vivo Count Results Corresponding to 5% SALI and 0.2% SALI from an Intake of TRU	April 28, 2010

Section 2RS05: Radiation Monitoring Instrumentation

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-01003	Callaway Plant Offsite Dose Calculation Manual	18
HTP-ZZ-4176-DTI-GTM-CAL	Eberline Model GTM Small Articles Monitor Calibration	1
HTP-ZZ-4177-DTI-PCM2-CAL	Eberline PCM-2 Calibration	2
HDP-ZZ-04000	Health Physics Instrument Program	22
HSP-ZZ-00014	Rad Monitor Inoperability	24

CALLAWAY ACTION REQUESTS

200905066	200906392	200908494	200908565	200908699
200910149	201000177	201000395	201002158	201002162

201002241

HEALTH PHYSICS CALIBRATION RECORDS

NUMBER	TITLE	DATE
H250.0006	FS-5301-HP Confirmation	August 11, 2010
H230.0016	WBC-6000-HP Confirmation Thyroid and GI Detectors	August 11, 2010
H250.0006	FS-5301-HP Semi-Annual Confirmation	September 2, 2010
H170.0064	PCM-2 Calibration PM-4027-HP	September 1, 2010
H170.0064	PCM-2 Calibration PM-4026-HP	July 9, 2010
H170.0064	PCM-2 Calibration PM-4022-HP	June 24, 2010
H170.0064	PCM-1B Calibration PM-4011-HP	March 17, 2010
H170.0064	PCM-1B Calibration PM-4011-HP	September 11, 2009
H170.0064	PM-7 Calibration PM-4023-HP	January 20, 2010
H170.0064	GTM Calibration TM-4004-HP	February 1, 2010
H170.0064	GTM Calibration TM-2005-HP	June 18, 2010

INSTRUMENTS AND CONTROLS CALIBRATION RECORDS

NUMBER	TITLE	DATE
08501446	0-GL-RE-10A – Radwaste Building Exhaust Monitor	August 11, 2009
08505097	0-GL-RE-10B – Radwaste Building Exhaust Monitor	December 23, 2009
07006479	0-GT-RE-21A – Plant Unit Vent Monitor	October 21, 2009
08502113	0-GT-RE-21B – Plant Unit Vent Monitor	December 10, 2009

08501577	0-HB-RE-18 – Liquid Radwaste Discharge Monitor	August 14, 2009

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
SAI-84/1161	Particulate Plateout Measurements on the Unit Vent Stack Wide-Range Air Monitor at Callaway Nuclear Power Station	July 9, 1984

4OA1: Performance Indicator Verification

CALLAWAY ACTION REQUESTS

200800817	200802579	200804000	200809152	200810216
200810598	200810933	200902027	200909560	201004091
201004284	201004541	201005247	201006434	

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
	Callaway Plant Mitigating System Performance Index (MSPI) Basis Document	3
	Callaway Plant Mitigating System Performance Index (MSPI) Basis Document	4

Section 4OA2: Identification and Resolution of Problems

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00500	Corrective Action Program	51
APA-ZZ-00500, Appendix 17	Screening Process Guidelines	11
EDP-ZZ-01121	Raw Water Program	14

OSP-BB-VL006	RCS Pressure Isolation Valve Inservice Tests – IPTE	39

DRAWINGS

NUMBER	TITLE	REVISION
68674	Cross Section Model AA-6-1.5L ASME Sect. III CL. 3	2
64688	Outline Model AA-6-1.5L ASME Sect. III Cl. 3	0
M-23-EF02	Piping Isometric Essential Service Water Sys. Aux. Bldg. “A” Train Supply	33
M-23-EF03	Piping Isometric Essential Service Water Sys. Aux. Bldg. “A” Train Return	32
M-23-EF06	Piping Isometric Essential Service Water Sys. Aux. Bldg. “A & ” Train Supply and Return	23

CALLAWAY ACTION REQUESTS

200701822	201009582	201004084	201010530	201010804
201007394	201003962	201009333	201010530	201011438

JOBS

C711091	P716660	05508174	06525445	05508174
08001100	08004887	06524404	08504662	08504662
07504727	10003124	10003167	09503853	10008475

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
SLNRC 84-0087	SNUPPS Technical Specifications Reactor Systems Branch Issues	May 25, 1984
RFR 201010785	Clarify the regulatory and design basis for pipe break and flooding	November 17, 2010

Section 4OA3: Identification and Resolution of Problems

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00102	EOP/OTO Writer's Manual	11
ODP-ZZ-00025	EOP/OTO User's Guide	14
OTO-EG-00001	CCW System Malfunction	11

DRAWINGS

NUMBER	TITLE	REVISION
M-22EG01(Q)	Piping and Instrumentation Diagram Component Cooling Water System	9
M-22EG02(Q)	Piping and Instrumentation Diagram Component Cooling Water System	19
M-22EG03(Q)	Piping and Instrumentation Diagram Component Cooling Water System	22

CALLAWAY ACTION REQUESTS

200300176 200910153