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

July 31, 2014

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

SUBJECT: CALLAWAY PLANT-NRC TRIENNIAL BASELINE COMPONENT DESIGN BASES INSPECTION NRC INSPECTION REPORT 05000483/2014007

Dear Mr. Diya:

On May 16, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. The enclosed inspection report documents the inspection results which were discussed on May 16, 2014, with Mr. F. Diya, Senior Site Vice President and Chief Nuclear Officer, and other members of your staff. After additional in-office inspection, a final telephonic exit meeting was conducted on July 2, 2014, with Mr. M. McLachlan, Senior Director Engineering, and other members of your staff.

The inspection 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.

Seven NRC-identified findings of very low safety significance (Green), and one Severity Level IV finding were identified during this inspection. All of the findings were determined to involve violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspectors at the Callaway Plant. The information you provide will be considered in accordance with Inspection Manual Chapter 0305. In addition, if you disagree with the characterization of the cross-cutting 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 Inspectors at the Callaway Plant.

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

Sincerely,

/RA/

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

Docket Nos.: 50-483
License Nos.: NPF-30

Enclosure:
Inspection Report 05000483/2014007,
w/Attachment: Supplemental Information

cc w/encl:
Electronic Distribution for Callaway Plant

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000483
License:	NPF-30
Report Nos.:	2014007
Licensee:	Ameren Electric Co.
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O, Fulton, Missouri
Dates:	April 14 through July 2, 2014
Team Leader:	R. Kopriva, Senior Reactor Inspector, Engineering Branch 1
Inspectors:	J. Braisted, Ph.D., Reactor Inspector, Engineering Branch 1 B. Correll, Reactor Inspector, Engineering Branch 2 C. Hale, Reactor Inspector, Engineering Branch 1 S. Hedger, Operations Examiner, Operations Branch
Accompanying Personnel:	C. Baron, Mechanical Contractor, Beckman and Associates G. Nicely, Electrical Contractor, Beckman and Associates
Approved By:	Thomas R. Farnholtz, Chief Engineering Branch 1

Enclosure

SUMMARY

IR 05000483/2014007; April 14 through July 2, 2014; Callaway Plant baseline inspection, NRC Inspection Procedure 71111.21, “Component Design Bases Inspection”

The report covers an announced inspection by a team of five regional inspectors and two contractors. Seven NRC-identified findings of very low safety significance (Green), and one Severity Level IV finding were identified during this inspection. The final significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, “Significance Determination Process.” 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.

Cornerstone: Mitigating Systems

- Green. The team identified a Green, non-cited violation of Technical Specification 5.4.1, which states, in part, “Written procedures shall be established, implemented, and maintained covering the following activities: Part a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.” Regulatory Guide 1.33, Appendix A, Section 9, “Procedures for Performing Maintenance,” states in part, “Maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.” Specifically, from 2002 to April 24, 2014, due to the ineffective corrective action of Callaway Action Request (CAR) 200202970, the licensee did not establish preventative maintenance procedures to verify the operation and timing of the engineered safety feature transformers XNB01 and XNB02 load tap changers. In response to this issue, the licensee verified that immediate operability was not a concern since the measured parameters for the transformers did not indicate poor health or unsatisfactory performance. This finding was entered into the licensee’s corrective action program as Callaway Action Request (CAR) 201402827.

  The team determined that the failure to establish adequate preventative maintenance procedures to periodically verify the operation and timing of the engineered safety feature transformers XNB01 and XNB02 load tap changers was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform initial or periodic verification of the operation and timing of the engineered safety feature transformers XNB01 and XNB02 load tap changers could result in adverse operation of the load tap changer during a design basis event such that the safety-related buses may not have adequate voltage to reset the degraded voltage relay, thus spuriously disconnecting from the offsite power source. In accordance with Inspection Manual Chapter 0609, Appendix A, “Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the issue screened as having very low safety significance (Green) because it was a design or qualification

deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.6)

- Severity Level IV / Green. The team identified a Severity Level IV, non-cited violation of 10 CFR Part 50.59, "Changes, Tests and Experiments," which states, in part, "A licensee may make changes in the facility as described in the final safety analysis report, make changes in the procedures as described in the final safety analysis report, and conduct tests or experiments not described in the final safety analysis report without obtaining a license amendment only if: (ii) The change, test, or experiment does not meet any of the criteria in paragraph (c)(2) of this section." Paragraph (c)(2), states in part: "A licensee shall obtain a license amendment prior to implementing a proposed change, test, or experiment if the change, test, or experiment would: (ii) Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC), important to safety previously evaluated in the final safety analysis report." Specifically, on September 5, 2008, the licensee failed to complete a 10 CFR Part 50.59 Evaluation when they initiated Final Safety Analysis Report Change Notice (FSARCN) 08-012 to Final Safety Analysis Report Section 8.3.1.1.2, to exempt auxiliary feedwater control valves (ALHV0005, 0007, 0009, and 0011) from the requirements of Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves," Revision 1. For these auxiliary feedwater control valves, the licensee chose to leave the thermal overload relays in the motor operated valve circuits continuously, but failed to periodically test them to ensure continued functional reliability and the accuracy of the trip point. In response to this issue, the licensee verified that no actual safety consequences had occurred with the auxiliary feedwater system motor operated control valves. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403369.

  The team determined that the licensee's failure to identify that the proposed Final Safety Analysis Report change to their commitment to Regulatory Guide 1.106 Revision 1, requiring an evaluation to be performed, was a performance deficiency. This finding was evaluated using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. This finding was more than minor because there was a reasonable likelihood that the change would have required NRC review and approval prior to implementation. Specifically, during the 10 CFR Part 50.59 screen, the licensee failed to determine that the proposed Final Safety Analysis Report change to their commitment to Regulatory Guide 1.106, Revision 1, did involve a change to a structure, system, or component, such that it did adversely affect an Final Safety Analysis Report described design function, which required an evaluation to be performed. In accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening," traditional enforcement does apply as the violation impacted the regulatory process. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not

result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. The team assessed the violation in accordance with the Enforcement Policy, and determined it to be a Severity Level IV violation because it resulted in a condition evaluated by the Significance Determination Process as having very low safety significance (Enforcement Policy example 6.1.d.2). This finding did not have a cross-cutting aspect because cross-cutting aspects are not assigned to traditional enforcement violations. (Section 1R21.2.8)

- Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "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." Specifically, on October 23, 2006, the licensee failed to follow Procedure APA-ZZ-00101, "Processing Procedures, Manuals, and Desktop Instructions," when the reviewer did not realize that a revised step in Procedure EDP ZZ 01126, "Lubrication Predictive Maintenance Program," Revision 6, conflicted with requirements in Procedure APA-ZZ-00500, "Corrective Action Program." The licensee failed to identify that a new procedure step, which allowed licensee personnel the discretion to not initiate a Callaway Action Request when an abnormal or adverse condition was identified, was in conflict with expectations for initiating Callaway Action Requests for adverse conditions stated in Procedure APA-ZZ-00500. In response to this issue, the licensee will review their guidance documents and procedure training, along with their root cause procedure, because the conflict with the procedures had not been identified during the root cause investigation of the Essential Service Water Pump "B" lower motor bearing degradation. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403046.

  The team determined that the failure to identify that a revised step in Procedure EDP-ZZ-01126 was conflicting with expectations for initiating Callaway Action Requests for adverse conditions stated in Procedure APA-ZZ-00500 was a performance deficiency. This finding was more than minor because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, Revision 6 to Procedure EDP-ZZ-01126, "Lubrication Predictive Maintenance Program," was revised to allow licensee personnel the discretion of not using the Callaway Action Request System to document an abnormal or adverse condition when a bad oil sample had been identified. Consequently, the lubrication predictive maintenance program procedure, as written, has the potential to miss diagnosing/reporting of equipment problems and degradation prior to equipment failure. The original oil sample taken in October 2012 indicated a degraded condition, and it was not until a subsequent oil sample taken in February 2013, caused the licensee to write a Callaway Action Request when the Essential Service Water Pump "B" lower motor bearing had degraded, and the pump was taken out-of-service for replacement. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to

seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.13)

- Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," which states, in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Specifically, from 1999 to April 17, 2014, the licensee failed to establish a test program to demonstrate that the air flows for essential service water pump house supply fans CGD01A and CGD01B would keep the pump house room temperatures at or below the maximum allowable temperatures when the essential service water pumps are operating during a design basis accident. In response to this issue, the licensee verified that immediate operability was not a concern since the measured parameters (through eMAX and Motor Circuit Evaluator-+ testing) did not indicate poor health or unsatisfactory performance when compared to the fan curve. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201402698.

  The team determined that the failure to establish a test program to demonstrate that the air flows for the essential service water pump house supply fans were sufficient to keep room temperatures maintained at or below the design basis requirements was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the capability of the essential service water pump house supply fans to perform their safety function of providing 30,000 cubic feet per minute of air flow was not ensured. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.14)

- Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled." Specifically, prior to April 25, 2014, the licensee had failed to account for the temperature differences between inside and outside of electrical cabinets in the Class 1E electrical rooms, as well as the effects of these increased temperatures on the components in the cabinets with a single control building chiller out-of-service. In response to this issue, the licensee performed a

preliminary review of the calculation and confirmed that the components within the cabinets would continue to function in the event of a transient or accident with a single control building chiller out-of-service. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201402872.

The team determined that the failure to adequately account for increased temperatures within the Class 1E electrical cabinets, and the effect on the components in those cabinets, was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to evaluate the increased temperatures within the cabinets in Calculation NAI-1719-001 could establish non-conservative results that could lead to component failures, causing critical electrical equipment not to function. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a cross-cutting aspect, pertaining to identification, in the area of problem identification, because the licensee did not ensure that the organization implements a corrective action program with a low threshold for identifying issues. Individuals identify issues completely, accurately, and in a timely manner in accordance with the program [P.1]. (Section 1R21.2.17)

- Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "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." Specifically, between November 2013 and April 2014, the licensee did not follow Procedure EDP-ZZ-01114, "Motor Operated Valve Program Guide," Step 6.3.1, as they had not completed a test report for Motor Operated Valve BNLCV0112E, "Centrifugal Charging Pump Suction from Refueling Water Storage Tank Isolation Valve," within 60 days, as required by the procedure. The results of the analysis, when completed, were non-conservative with the measured stem coefficient increasing from the design value of 1.5 to approximately 1.7, decreasing the available torque margin from approximately 23 percent to 7 percent. In response to this issue, the licensee confirmed that all of the values in the Performance Report for BNLCV0112E were accurate and that the valve would still function. The licensee also initiated a work order to restore the valve margin. The licensee determined that several other diagnostic test results had not been analyzed in a timely manner; and evaluated these results which were found to be acceptable. This finding was entered into the licensee's corrective action program as Callaway Action Requests (CARs) 201402987 and 201402992.

The team determined that the failure to follow Procedure EDP-ZZ-01114 for the timely evaluation of motor operated valve test data was a performance deficiency. This finding was more than minor because if left uncorrected, it would lead to a more significant safety concern. Specifically, not reviewing motor operated valve data and completing the analysis of the data in a timely manner could result in safety-related motor operated valves not being able to meet their safety function. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a cross-cutting aspect, pertaining to resources, in the area of human performance, because licensee leaders failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety [H.1]. (Section 1R21.2.18.1)

- Green. The team identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," which states, in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Specifically, prior to May 1, 2014, the licensee failed to include the motor operated valve unseating torque in the motor operated valve torque calculation. This could establish non-conservative results that could lead to the valve not functioning. In response to this concern, the licensee performed informal analyses based on the most recent test results and verified that all the subject valves were functional. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403034.

  The team determined that the failure to include the motor operated valve unseating torque in the calculation of the required torque was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to include the valve disc unseating force in the torque calculation could establish non-conservative results that could lead to a failure of the valve to perform its safety function. The initial evaluation, based on a design friction coefficient of 0.2, identified four valves with zero or negative margin, however additional evaluation determined these valves were functional. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not

have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.18.2)

- Green. The team identified a Green, non-cited violation of 10 CFR Part 50.63(a)(2) which states, in part, "The reactor core and associated coolant, control, and protection systems, including station batteries and any other necessary support systems, must provide sufficient capacity and capability to ensure that the core is cooled and appropriate containment integrity is maintained in the event of a station blackout for the specified duration." Specifically, from April 15, 2011 to July 2, 2014, a change made to Emergency Operating Procedure Addendum 20, "Control Room Cabinet Door List," Revision 003, required control room operators to open a minimum of one control room cabinet door during a station blackout. Emergency Operating Procedure Addendum 20, Revision 003, was completed without any analysis or calculations performed to justify whether the electronics in the cabinets would have sufficient cooling with a minimum of one door open during a station blackout. This could result in insufficient cooling to the Solid State Protection System (SSPS) and other essential controls during a station blackout. In response to this issue, the licensee initiated actions to make the procedures consistent regarding how many doors should be opened for the given cabinets, and for engineering to investigate how many doors should be opened. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403029.

  The team determined that the failure to ensure that components located in control room cabinets, which provide input for the Solid State Protection System (SSPS), would remain operable during a station blackout, as assumed in the site's station blackout analysis, was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Procedure Quality, and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the change made to EOP Addendum 20, Revision 003, had been completed without documented review of the site's station blackout analysis or its assumptions to justify whether the components in the cabinets would have sufficient cooling with a minimum of one door open per cabinet during a station blackout. By not analyzing the concern to determine the effect of the temperature of the instrumentation and components in the cabinets, the licensee may subject the electronic components contained in the cabinets to temperatures that could degrade their capability to ensure core cooling and containment integrity. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a cross-cutting aspect, pertaining to change management, in the area of human performance, because the licensee had not used a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Without documented results of an analysis or justification, for the 2011 evaluation, the assumptions could not be verified to justify their actions [H.3]. (Section 1R21.4)

REPORT DETAILS

1. REACTOR SAFETY

Inspection of component design basis verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected components and operator actions to perform their design basis functions. As plants age, their design basis may be difficult to determine and important design features may be altered or disabled during modifications. The plant risk assessment model assumes the capability of safety systems and components to perform their intended safety function successfully. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance.

1R21 Component Design Bases Inspection (71111.21)

To assess the ability of the Callaway Plant equipment and operators to perform their required safety functions, the team inspected risk-significant components and the licensee's responses to industry operating experience. The team selected risk-significant components for review using information contained in the Callaway Plant probabilistic risk assessments and the U. S. Nuclear Regulatory Commission's (NRC) standardized plant analysis risk model. In general, the selection process focused on components that had a risk achievement worth factor greater than 1.3 or a risk reduction worth factor greater than 1.005. The items selected included components in both safety-related and non-safety related systems including pumps, circuit breakers, heat exchangers, transformers, and valves. The team selected the risk-significant operating experience to be inspected based on its collective past experience.

.1 Inspection Scope

To verify that the selected components would function as required, the team reviewed design basis assumptions, calculations, and procedures. In some instances, the team performed calculations to independently verify the licensee's conclusions. The team also verified that the condition of the components was consistent with the design basis and that the tested capabilities met the required criteria.

The team reviewed maintenance work records, corrective action documents, and industry operating experience records to verify that licensee personnel considered degraded conditions and their impact on the components. For the review of operator actions, the team observed operators during simulator scenarios, as well as during simulated actions in the plant.

The team performed a margin assessment and detailed review of the selected risk-significant components to verify that the design basis have been correctly implemented and maintained. This design margin assessment considered original design issues, margin reductions because of modifications, and margin reductions identified as a result of material condition issues. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as failed performance test results; significant corrective actions; repeated maintenance;

10 CFR 50.65(a)1 status; operable, but degraded conditions; NRC resident inspector input of problem equipment; system health reports; industry operating experience; and licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in-depth margins.

The inspection procedure requires a review of 15 to 25 total samples that include risk-significant and low design margin components, containment related components, and operating experience issues. The sample selection for this inspection was nineteen components, one of which was associated with containment; seven operating experience items; and three event based activities associated with the components. The selected inspection and associated operating experience items supported risk-significant functions including the following:

a. Electrical power to mitigation systems: The team selected several components in the electrical power distribution systems to verify operability to supply alternating current (ac) and direct current (dc) power to risk-significant and safety-related loads in support of safety system operation in response to initiating events such as loss of offsite power, station blackout, and a loss-of-coolant accident with offsite power available. As such, the team selected:

    - Battery NK14
    - Battery PK12
    - 480 Volt Load Center Bus NG08
    - 480 Volt Load Center Bus NG04
    - Essential Service Water/Service Water (ESW/SW) Cross-connect valve(s) EFHV-23,-25,-39, and -41
    - Engineered Safety Feature Load Tap Changer Transformer XNB02 and Supporting Capacitor Bank NB04
    - 4.16kV Bus NB02
    - 480Volt Motor Control Center (MCC) Breaker NG01BER2
    - Alternate Emergency Power Supply Emergency Diesel Generators EDGPA5001

b. Components that affect large-early-release-frequency (LERF): The team reviewed components required to perform functions that mitigate or prevent an unmonitored release of radiation. As such, the team selected the following components:

    - Containment Airlock Door Seals

c. Mitigating systems needed to attain safe shutdown: The team reviewed components required to perform the safe shutdown of the plant. As such, the team selected:

- Component Cooling Water Pump "A" (PEG01A)
- Condensate Storage Tank (TAP01)
- Essential Service Water Pump "B" (PEF01B)
- Essential Service Water Pump house Supply Fans (CGD01 A/B)
- Refueling Water Storage Tank and Level Transmitters
- Non-Safety Related Auxiliary Feedwater pump (DPAP01)
- Control Building Heating Ventilation/Air Conditioning (HVAC) Chilled Water System
- Motor Operated Valve (MOV) (BNLCV0112E)
- Turbine Driven Auxiliary Feedwater Pump "A"

.2 Results of Detailed Reviews for Components

.2.1 Battery NK14

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with Battery NK14 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure that the equipment was capable of performing its desired design basis function. Specifically, the team reviewed:

- Sizing and testing document to verify the battery was adequately sized and tested to ensure it is capable of performing its required safety function.
- Duty cycle loading and capacity verification to ensure the battery is appropriately sized with sufficient design margin and appropriate aging factors were used for an expected life of 20 years.
- Voltage drop calculations to confirm cable sizes and temperatures were adequately evaluated and that the system loads minimum voltage requirements were being met under worst case battery loading conditions.

- Maintenance procedures to ensure adequate float and equalizing charge voltages were being provided, and that battery tests required by technical specifications (TS), including service and performance discharge tests, were being performed at the technical specifications required frequency and met the technical specifications specified acceptance criteria.

- Schematics and cable raceway data to ensure sufficient voltage available for the emergency diesel generator output breaker closing coil during a station blackout event.

- Vendor technical manual and industry standards for proper installation and maintenance of the battery.

- Conducted battery walk-downs to determine the physical and material condition, and to confirm the battery and charger room temperatures were within specified design temperature ranges. The team also inspected for sign of degradation such as excessive terminal corrosion and electrolyte leaks.

b. Findings

No findings were identified.

.2.2 Battery PK12

a. Inspection Scope

Battery PK12 is a non-safety related battery, but is risk-significant because it provides the 125Vdc control power necessary for operation of circuit breakers and circuit interrupters required for realignment of the offsite power to the emergency bus following a loss of offsite power or station blackout event. Additionally, the battery provides DC power to various fire protection components. In selecting Battery PK12, the team considered its potential failure and the resulting consequences for mitigating the above events. The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with Battery PK12 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Sizing and testing document to verify the battery was adequately sized and tested to ensure it is capable of performing its required function.

- Duty cycle loading and capacity verification to ensure the battery is appropriately sized with sufficient design margin and appropriate aging factors were used for an expected life of 20 years.

- Voltage drop calculations to confirm cable sizes and temperatures were adequately evaluated and that the system loads minimum voltage requirements were being met under worst case battery loading conditions.

- Maintenance procedures to ensure adequate float and equalizing charge voltages were being provided, including the Maintenance Rule scope to ensure proper functional testing is performed.

- Vendor technical manual and industry standards for proper installation and maintenance of the battery.

- Conducted battery walk-downs to determine the physical and material condition, and to confirm the battery and charger room temperatures were within specified design temperature ranges. The team also inspected for sign of degradation such as excessive terminal corrosion and electrolyte leaks.

b. Findings

No findings were identified.

.2.3 480 Volt Load Center Bus NG08

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with 480 Volt Load Center Bus NG08 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Coordination studies to verify protective devices are properly set to protect continuity of electrical power.

- Voltage drop calculations to confirm cable sizes and temperatures were adequately evaluated and that the system loads minimum voltage requirements were being met under worst case voltage conditions.

- Circuit breaker maintenance activities to ensure design functions are being maintained.

- Overload setpoint calculation and settings to verify proper cable and load protection.

b. Findings

No findings were identified.

.2.4 480 Volt Load Center Bus NG04

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with 480 Volt Load Center Bus NG04 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Load Center one-line diagrams.
- Bus loading study during normal plant operation and design basis accidents.
- Vendor data on breaker and bus short circuit current ratings.
- Electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination calculations.
- Protective device settings and circuit breaker ratings to confirm operation during worst-case short circuit conditions.
- Circuit breaker preventive maintenance inspection and testing procedures including vendor recommendations.

b. Findings

No findings were identified.

.2.5 Essential Service Water/Service Water (ESW/SW) Cross-connect valve(s) EFHV-23, -25, -39, and -41

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the Essential Service Water/Service Water (ESW/SW) Cross-connect valve(s) EFHV 23, -25, -39, and -41, to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews to ensure that the equipment was capable of performing its desired design basis function. Specifically, the team reviewed:

- Work orders, and corrective action program documents to verify maintenance activities and frequencies are sufficient to support the design functions of the valves.

- NRC Information Notice 1992-18 circuit evaluation and modification to verify design functions would be maintained.

- Overload relay settings to verify proper motor protection.

- Voltage drop calculations to ensure the valve motor and control circuit components are capable of performing their design function under worst case supply voltage conditions.

b. Findings

No findings were identified.

.2.6 Engineered Safety Feature Load Tap Changer Transformer XNB02 and Supporting Capacitor Bank NB04

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with Engineered Safety Feature Load Tap Changer Transformer XNB02 and supporting Capacitor Bank NB04 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired functions. Specifically, the team reviewed:

- Single line drawings of the transformer and associated capacitor bank.

- Preventive maintenance inspection and testing procedures including vendor recommendations.

- Automatic load tap changer and capacitor bank vendor specifications, setpoints, and control circuit calculations.

- Adequacy of transformer and capacitor banks to regulate and supply acceptable voltage within acceptable times to 4KV safety buses during normal and design basis events.

- Protective device settings to confirm equipment protection during worst-case short circuit conditions.

b. Findings

Failure to Establish Adequate Procedures for Testing the Load Tap Changers on Transformers XNB01 and XNB02

Introduction. The team identified a Green, non-cited violation of Technical Specification 5.4.1, "Procedures," involving the failure to establish adequate maintenance procedures to periodically verify transformer XNB01 and XNB02 load tap changer operation and time testing. Specifically, due to the ineffective corrective action of Callaway Action Request (CAR) 200202970, the licensee did not implement preventative maintenance activities to verify the operation and timing of the transformer load tap changers. As a result, the timing of the load tap changer may not be consistent with plant electrical analysis, ZZ-62, which credit the load tap changer operation in order to reset the degraded voltage relays between sequenced load steps.

Description. In 2002, the licensee installed modification MP 99-1083 to the engineered safety feature transformer load tap changer. During the installation, the licensee performed a review of industry operating experience and found information identifying that time testing of the load tap changer operation was required to ensure proper operation was maintained, to ensure operability of the off-site power sources. Operating experience has shown the load tap changer mechanical operation can slow down over time due to aging mechanisms such as friction and hardened grease. This can result in the unmonitored degraded performance of the load tap changer to not provide acceptable voltages from the offsite power sources to the safety-related power distribution system. As a result, the expected speed of the load tap changer, to correct for low voltage, may not meet design requirements. Callaway Action Request (CAR) 200202970 was written to ensure that a Preventive Maintenance (PM) was made to periodically check for proper load tap changer operation and timing. Callaway Action Request (CAR) 200202970 was closed to the Maintenance Optimization Project. As a result of the action request, the licensee's maintenance database, EMPRV, for transformers XNB01 and XNB02, preventative maintenance basis, show that operation and timing of the load tap changer is to be periodically verified every fourth refueling outage. However, the team could not find any preventative maintenance procedures, documents, or records that would indicate that the required timing test of the load tap changer was being performed. Additionally, no verification of load tap changer timing appears to have been performed since the transformer load tap changer modification MP 99-1083 was installed in 2002.

Callaway Technical Specifications section 5.4.1, "Procedures," state that written procedures shall be established, implemented, and maintained covering the following activities: Part a. The applicable procedures recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, February 1978. RG 1.33, Appendix A, Section 9, "Procedures for Performing Maintenance", states that maintenance that can affect the performance of safety-related equipment should be performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. The team determined that the licensee had not 1) adequately performed a timing test of the load tap changer to ensure proper operation, nor 2) had they periodically performed a timing test to ensure proper operation to maintain the operability of the offsite power

sources. As a result, the timing of the load tap changer may not be consistent with plant electrical analysis, ZZ-62, which credit the load tap changer operation in order to reset the degraded voltage relays between sequenced load steps. In response to this issue, the licensee has entered the procedural inadequacies in their corrective action program as Callaway Action Request (CAR) 201402827, to create preventative maintenance requirements and determine why the preventative maintenance requirements had not been generated when the modification was installed.

Analysis. The team determined that the failure to establish adequate preventative maintenance procedures to periodically verify the operation and timing of the engineered safety feature transformers XNB01 and XNB02 load tap changers was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform initial or periodic verification of the operation and timing of the engineered safety feature transformers XNB01 and XNB02 load tap changers could result in adverse operation of the load tap changer during a design basis event such that the safety-related buses may not have adequate voltage to reset the degraded voltage relay, thus spuriously disconnecting from the offsite power source. In accordance with Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance.

Enforcement. The team identified a Green, non-cited violation of Technical Specification 5.4.1, which states, in part, "Written procedures shall be established, implemented, and maintained covering the following activities: Part a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Regulatory Guide 1.33, Appendix A, Section 9, "Procedures for Performing Maintenance," states in part, "Maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." Contrary to the above, from 2002 to April 24, 2014, the licensee did not have written procedures established, implemented, and maintained as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978 for performing maintenance that can affect the performance of safety-related equipment. Specifically, due to the ineffective corrective action of Callaway Action Request (CAR) 200202970, the licensee did not establish preventative maintenance procedures to verify the operation and timing of the engineered safety feature transformers XNB01 and XNB02 load tap changers. In response to this issue, the licensee verified that immediate operability was not a concern since the measured parameters for the transformers did not indicate poor health or unsatisfactory performance. This finding

was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201402827. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014007-01, "Failure to Establish Adequate Procedures for Testing the Load Tap Changers on Transformers XNB01 and XNB02."

.2.7 4.16kV Bus NB02

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the 4.16kV Bus NB02 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform the desired function. Specifically, the team reviewed:

- Bus one-line diagrams.
- Bus loading study during normal plant operation and design basis accident load conditions.
- Vendor data on breaker and bus short circuit current ratings.
- Electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination calculations.
- Protective device settings and circuit breaker ratings to confirm operation during worst-case short circuit conditions.
- Station interface and coordination with the transmission system operator for station voltages requiring plant notifications.
- Loss and degraded voltage relay setpoints and associated time delays, including calculation assumptions, instrument inaccuracies, and associated Technical Specification surveillances/Limiting Conditions for Operations (LCOs).
- Operating procedures for normal, abnormal, and emergency conditions.
- Vendor data for the bus and associated circuit breakers short circuit ratings.
- Cable sizing requirements.
- Preventive maintenance and surveillance test procedures.

- Completed surveillance and maintenance documentation.
- Modifications performed.

b. Findings

No findings were identified.

.2.8 480 Volt Motor Control Center (MCC) Breaker NG01BER2

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, calculations, vendors manual, and Callaway Action Requests associated with the 480 Volt Motor Control Center (MCC) Breaker NG01BER2 on Motor Control Center (MCC) NG01B to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Motor Control Center (MCC) one-line diagrams.
- Bus loading study during normal plant operation and design basis accidents.
- Electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination calculations.
- Vendor Data on breaker short circuit current ratings.
- Protective device settings and circuit breaker ratings to confirm operation during worst-case short circuit conditions.
- Circuit breaker and thermal overload heater preventive maintenance inspection and testing procedures including vendor recommendations.

b. Findings

10 CFR Part 50.59 Screen for the Auxiliary Feedwater Motor Operated Control Valves Thermal Overload Relays.

Introduction. The team identified a Severity Level IV, non-cited violation of 10 CFR Part 50.59, “Changes, Tests, and Experiments,” and an associated Green finding, involving the licensee’s failure to appropriately perform a written evaluation of proposed changes to Final Safety Analysis Report (FSAR) Section 8.3.1.1.2. Specifically, in September 2008, as a part of change notice FSARCN 08-012, the licensee incorrectly completed the 10 CFR Part 50.59 screen, to determine if the proposed Final Safety

Analysis Report change to their commitment to Regulatory Guide 1.106, Revision 1, did involve a change to structures, systems, or components such that it did adversely affect a Final Safety Analysis Report described design function.

Description. Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves," Revision 1, specified methods acceptable to the NRC staff for complying with 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and allowed licensees to either bypass the thermal overload relays during a design basis event or leave the thermal overload relays in the motor operated valve circuit continuously, provided that they were sized properly and periodically tested. These methods would ensure that the thermal overload relay devices would not needlessly prevent the motor from performing its safety-related function. The licensee stated in Final Safety Analysis Report Section 8.3.1.1.2, that the thermal overload relay trip contacts for Class 1E valves are bypassed with jumpers except when the valve motors are undergoing periodic or maintenance testing.

In September 2008, the licensee initiated Final Safety Analysis Report Change Notice (FSARCN) 08-012 to Final Safety Analysis Report Section 8.3.1.1.2, to exempt auxiliary feedwater control valves (ALHV0005, 0007, 0009, and 0011) from the requirements of Regulatory Guide 1.106, Revision 1. For these auxiliary feedwater control valves, the licensee chose to leave the thermal overload relays in the motor operated valve circuits continuously, but failed to periodically test them to ensure continued functional reliability and the accuracy of the trip point. The licensee's position for these four valves was contrary to the statements in Final Safety Analysis Report Section 8.3.1.1.2. A part of change notice FSARCN 08-012 required that a 10 CFR Part 50.59 applicability review be performed. The applicability review results required that a 10 CFR Part 50.59 screening be performed. The licensee then proceeded to complete the 10 CFR Part 50.59 screening, and concluded that this change did not adversely affect a Final Safety Analysis Report described design function. The team determined that this response was incorrect and that a 10 CFR Part 50.59 evaluation should have been performed.

According to guidance in Nuclear Energy Institute (NEI) 96-07, Revision 1, "Guidelines for 10 CFR 50.59 Implementation," which the NRC endorsed in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, And Experiments," dated November 2000, a change to a structure, system, or component, such that it adversely affects an Final Safety Analysis Report described function is a change that is controlled by 10 CFR Part 50.59. The guidance states that prior approval by the NRC is required if the activity results in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety. Safety Evaluation Report dated June 1983, Section 8.3.3.1.2 stated "By Revision 10 to the Final Safety Analysis Report, the applicant indicated that the thermal overload relay trip contacts for all Class 1E valves will be permanently bypassed with jumpers before fuel load." Since the licensee's exemption of the four auxiliary feedwater control valves from the requirements of Regulatory Guide 1.106 differed from what the NRC had previously approved for Callaway in the Safety Evaluation Report dated June 1983, the exemption would have required NRC review and approval prior to implementation.

Analysis. The team determined that the licensee's failure to identify that the proposed FSAR change to their commitment to Regulatory Guide 1.106 Revision 1, requiring an evaluation to be performed, was a performance deficiency. This finding was evaluated using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. This finding was more than minor because there was a reasonable likelihood that the change would have required NRC review and approval prior to implementation. Specifically, during the 10 CFR Part 50.59 screen, the licensee failed to determine that the proposed FSAR change to their commitment to Regulatory Guide 1.106, Revision 1, did involve a change to a structure, systems, or components such that it did adversely affect an FSAR described design function, which required an evaluation to be performed. In accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening," traditional enforcement does apply as the violation impacted the regulatory process. Using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. The team assessed the violation in accordance with Enforcement Policy, and determined it to be a Severity Level IV violation because it resulted in a condition evaluated by the Significance Determination Process as having very low safety significance (Enforcement Policy example 6.1.d.2). This finding did not have a cross-cutting aspect because cross-cutting aspects are not assigned to traditional enforcement violations.

Enforcement. The team identified a Severity Level IV, non-cited violation of 10 CFR Part 50.59, "Changes, Tests, and Experiments," which states, in part, "A licensee may make changes in the facility as described in the final safety analysis report, make changes in the procedures as described in the final safety analysis report, and conduct tests or experiments not described in the final safety analysis report without obtaining a license amendment only if: (ii) The change, test, or experiment does not meet any of the criteria in paragraph (c)(2) of this section. Paragraph (c)(2), states in part: "A licensee shall obtain a license amendment prior to implementing a proposed change, test, or experiment if the change, test, or experiment would: (ii) Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the final safety analysis report." Contrary to the above, on September 5, 2008, the licensee failed to determine that the proposed Final Safety Analysis Report change would have resulted in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the final safety analysis report. Specifically, the licensee failed to complete a 10 CFR Part 50.59 Evaluation when they initiated Final Safety Analysis Report Change Notice 08-012 to Final Safety Analysis Report Section 8.3.1.1.2, to exempt auxiliary feedwater control valves (ALHV0005, 0007, 0009, and 0011) from the requirements of Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves," Revision 1. For these auxiliary feedwater control valves, the licensee chose to leave the thermal overload relays in the motor operated valve circuits continuously, but

failed to periodically test them to ensure continued functional reliability and the accuracy of the trip point. In response to this issue, the licensee verified that no actual safety consequences had occurred with the auxiliary feedwater system motor operated control valves. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403369. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014007-02, "10 CFR Part 50.59 Screen for the Auxiliary Feedwater Motor Operated Control Valves Thermal Overload Relays."

.2.9 Alternate Emergency Power Supply Emergency Diesel Generators EDGPA5001

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the Alternate Emergency Power Supply Emergency Diesel Generators EDGPA5001 to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Alternate emergency power supply single line drawings.
- Alternate emergency power supply design basis requirements.
- Expected emergency diesel generator loading during events when being credited to supply power to the auxiliary power distribution system.
- Electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination calculations.
- Discussions with operations and systems engineering personnel on the operation of the alternate emergency power supply.

b. Findings

No findings were identified.

.2.10 Containment Airlock Door Seals

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the containment personnel hatch door seals to ensure design basis requirements and specifications were met. The

team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Technical specifications and bases documents.
- Surveillance procedures and results for door and shaft seal leak tests.
- Local Leak Rate Test B and C summary data and maintenance rule criteria.
- Vendor manual for personnel hatch and calculation of qualified life for seals.
- Preventive maintenance procedures and completed jobs.
- Work orders and corrective action program documents.

b. Findings:

No findings were identified.

.2.11 Component Cooling Water Pump "A" (PEG01A)

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with Component Cooling Water Pump "A" (PEG01A) to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Apparent and root cause evaluations.
- Calculations involving the component cooling water circulation time via the residual heat removal heat exchanger, allowable gas void volume in each train of the component cooling water suction piping, and water hammer due to voids in component cooling water system piping.
- Corrective action program reports.
- Operating experience.
- Piping and instrumentation diagrams.
- Preventive maintenance instructions.
- System design criteria.
- System operating instructions.
- Technical specifications and bases documents.

- Trend data including inservice testing vibration data and motor lubricating oil sample analyses.

- Vendor documentation.

b. Findings

No findings were identified.

.2.12 Condensate Storage Tank (TAP01)

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the Condensate Storage Tank (TAP01) to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Calculations of the effect of dissolved nitrogen on the net positive suction head of auxiliary feedwater pumps, the potential for vortex formation in the condensate storage tank, the volume contained within the tank at the alarm and control setpoints, the level within the tank at the technical specification limit, and calculations involving tank postulated line breaks.

- Corrective action program reports.

- Piping and instrumentation diagrams.

- System design criteria.

- System operating instructions for condensate storage tank deoxygenation and aligning essential service water to auxiliary feedwater suction.

- Technical specifications and bases documents.

- Trend data for condensate storage tank level and water chemistry such as dissolved oxygen concentration.

- Vendor documentation.

b. Findings

No findings were identified.

.2.13 Essential Service Water Pump "B" (PEF01B)

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the Essential Service Water Pump "B" (PEF01B) to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Apparent and root cause evaluations involving lower motor radial guide bearing degradation.
- Calculations involving pump runout conditions.
- Corrective action program reports.
- Operating experience.
- Piping and instrumentation diagrams.
- Preventive maintenance instructions and bases documentation.
- System design criteria and specifications.
- System operating instructions including those involving time-critical operator actions such as aligning essential service water to auxiliary feedwater suction and switching the ultimate heat sink pond temperature indication from the ultimate heat sink cooling tower inlet to the essential service water pump discharge.
- Technical specifications and bases documents.
- Trend data including inservice testing vibration data and motor lubricating oil sample analyses.
- Vendor documentation.

b. Findings

Failure to Follow Procedures by Not Identifying a Conflict Between Two Procedures

Introduction. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the failure to identify a conflict with an existing procedure while revising another procedure.

Specifically, when the licensee reviewed Procedure EDP-ZZ-01126, "Lubrication Predictive Maintenance Program," Revision 6, for conflicts with other procedures using Procedure APA-ZZ-00101, "Processing Procedures, Manuals, and Desktop Instructions," the licensee failed to identify that a new procedure step, which allowed licensee personnel the discretion to not initiate a Callaway Action Request when an abnormal or adverse condition was identified, was in conflict with expectations for initiating Callaway Action Requests for adverse conditions stated in Procedure APA-ZZ-00500, "Corrective Action Program."

Description. On February 13, 2013, the licensee performed Essential Service Water (ESW) train B surveillance testing. While Essential Service Water Pump "B" was in operation, licensee personnel observed that the oil in the sight glass of the lower motor bearing appeared abnormally dark. The licensee declared Essential Service Water Pump "B" inoperable and entered Technical Specification Action Statement 3.7.8.A based upon the suspicion of bearing degradation. Subsequently, the licensee sampled and analyzed the oil. The analysis revealed significant increases in particulates compared with the previous oil sample on October 23, 2012.

During the inspection, the team reviewed the root cause analysis for Callaway Action Request 201301102. The root cause analysis evaluated the Essential Service Water Pump "B" lower motor bearing degradation. The team noted that the oil sample from October indicated particulate counts above the alert level. Additionally, the team noted that that the licensee had identified that a Callaway Action Request should have been initiated to document the increased particle count condition. A Callaway Action Request would have required additional review, management scrutiny, and corrective actions. Furthermore, the licensee viewed this as a missed opportunity in early detection of bearing degradation.

After reviewing the root cause analysis, the team reviewed Procedure EDP-ZZ-01126, "Lubrication Predictive Maintenance Program," Revision 16. This procedure provides guidelines for sampling and analyzing lubricating oil and grease to assist in diagnosing/reporting of equipment problems and degradation prior to equipment failure. The team noted that Step 4.4.1 states "WHEN abnormal/adverse conditions from an oil sample exist, at the discretion of the Lubrication Engineer, DOCUMENT the basic analysis results summary using a Callaway Action Request (CAR)." The team determined that this step, which allows licensee personnel the discretion not to initiate a Callaway Action Request for an adverse/abnormal condition, contradicted the licensee's expectations for initiating Callaway Action Requests.

After reviewing the predictive maintenance procedure, the team reviewed Procedure APA-ZZ-00500, "Corrective Action Program," Revision 60. This procedure presents guidance on how to implement the Callaway Corrective Action Program in accordance with the requirements of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The team noted that Step 4.1.1 states "ANYONE can, and is expected to INITIATE a Callaway Action Request (CAR) document when they discover an adverse condition. The CAR is to be initiated within 24 hours of discovery." Therefore, the team determined that Step 4.4.1 of EDP-ZZ-01126 was in conflict with Step 4.1.1 of APA-ZZ-00500. Subsequently, the team identified that Revision 6

of EDP-ZZ-01126 was the first time the specific wording appeared in Step 4.4.1 of EDP-ZZ-01126 that allowed licensee personnel not to initiate a Callaway Action Request when an abnormal/adverse condition is identified.

After establishing that two licensee procedures were in conflict with one another, the team reviewed Procedure APA-ZZ-00101, "Processing Procedures, Manuals, and Desktop Instructions," Revision 42, which establishes the process for the preparation, review, and approval of plant procedures, applicable written instructions, and related documents. Procedure APA-ZZ-00101 covers new procedures and revisions to procedures, among others. The procedure revision process includes steps for reviewing, verifying, and validating the new revision and checklists to aid in this process. One of the review checklist attributes is identifying conflicts or impacts on any existing documents. Therefore, because the licensee had failed to identify the conflict between EDP-ZZ-01126 and APA-ZZ-00500, the team concluded that the licensee had not accomplished Procedure APA-ZZ-00101 in accordance with written instructions.

Analysis. The team determined that the failure to identify that a newly revised step in Procedure EDP-ZZ-01126 was conflicting with expectations for initiating Callaway Action Requests for adverse conditions stated in Procedure APA-ZZ-00500, was a performance deficiency. This finding was more than minor because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, Revision 6 to Procedure EDP-ZZ-01126, "Lubrication Predictive Maintenance Program," was revised to allow the licensee personnel the discretion of not using the Callaway Action Request system to document an abnormal or adverse condition when a bad oil sample had been identified. Consequently, the lubrication predictive maintenance program procedure, as written, has the potential to miss diagnosing/reporting of equipment problems and degradation prior to equipment failure. The original oil sample taken in October 2012, indicated a degraded condition, and it wasn't until a subsequent oil sample taken in February 2013 caused the licensee to write a Callaway Action Request when the Essential Service Water Pump "B" lower motor bearing had degraded, and the pump was taken out-of-service for replacement. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance.

Enforcement. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "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 October 23, 2006, activities affecting quality were not prescribed by documented instructions, procedures, or drawing, of a type appropriate to the circumstances and

were not accomplished in accordance with these instructions, procedures, or drawings. Specifically, the licensee failed to follow Procedure APA-ZZ-00101, "Processing Procedures, Manuals, and Desktop Instructions," when the reviewer did not realize that a revised step in Procedure EDP-ZZ-01126, "Lubrication Predictive Maintenance Program," Revision 6, conflicted with requirements in Procedure APA-ZZ-00500, "Corrective Action Program." The licensee failed to identify that a new procedure step, which allowed licensee personnel the discretion to not initiate a Callaway Action Request when an abnormal or adverse condition was identified, was in conflict with expectations for initiating Callaway Action Requests for adverse conditions stated in Procedure APA-ZZ-00500. In response to this issue, the licensee will review their guidance documents and procedure training, along with their root cause procedure, because the conflict with the procedures had not been identified during the root cause investigation of the Essential Service Water Pump "B" lower motor bearing degradation. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403046. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014007-03, "Failure to Follow Procedures by Not Identifying a Conflict Between Two Procedures."

.2.14 Essential Service Water Pump house Supply Fans (CGD01 A/B)

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with the essential service water pump house supply fans to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Design basis manual and system health reports.
- Seismic analyses and vendor manuals for the fan and motor.
- Startup testing field report and fan manufacturer's performance curves.
- Pump house cooling and heating requirement calculations.
- Pump house temperature trend data and equipment temperature rating data.
- Preventive maintenance work instructions and results for the motor.
- Work orders, operability determinations, and corrective action program documents.

b. Findings

Failure to Establish Essential Service Water Pump House Supply Fan Testing

Introduction. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," because the licensee failed to establish a test program to assure that all testing required to demonstrate that components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Specifically, the licensee failed to establish a test program to demonstrate that the air flows for Essential Service Water Pump house Supply Fans CGD01A and CGD01B would keep the pump house room temperatures at or below the maximum allowable temperatures when the essential service water pumps were operating during a design basis accident.

Description: As described in Callaway Final Safety Analysis Report, Section 9.4.8, "Essential Service Water Pump house Ventilation," the function of the essential service water pump house ventilation system is to provide an environment suitable for operation of the essential service water pump motors and associated electrical equipment. The essential service water pump house ventilation system is designed to limit the building to a maximum ambient temperature of 122 degrees Fahrenheit (50 degrees Celsius), using outside air as the cooling medium. The design basis requirement to maintain the essential service water pump houses at or below 122 degrees Fahrenheit is accomplished by a supply fan air flow of 30,000 cubic feet per minute, as established in Calculation M-GD-234, "Cooling and heating requirements for the essential service water pumphouse," Revison 1.

Based on this information, the team asked the licensee how they verify that the essential service water pump house ventilation system is capable of meeting its design requirements, specifically how they verify the air flow of the supply fan. The licensee stated that they do not directly measure air flow, but they do perform a number of preventive maintenance tasks on the fan motors. The licensee provided preventive maintenance procedures and satisfactory test results for tasks performed on the fan motors, including offline motor testing, vibration monitoring, and eMAX testing, which monitors the electrical parameters of the motor. The team determined that the existing test program, which is focused on the fan motor, could not be used to verify the air flow requirement of the fan and would not provide indication if the fan blades were degraded.

Through conversations with the licensee, the team discovered that prior to 1999 the licensee indirectly verified air flow by measuring static pressure, which they correlated to air flow on the fan manufacturer's performance curves. In 1999, the licensee stopped taking static pressure measurements when they started a more robust preventive maintenance program for the fan motor (eMAX testing); however the licensee was unable to demonstrate how the motor testing could accurately predict fan air flow. The finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201402698.

Additionally, the team noted that the licensee did not perform any monitoring or preventive maintenance on the fans to ensure that there was no degradation of the fan blades, change in fan blade pitch (it has adjustable pitch fan blades), buildup of dust or grease, checking for a change in friction on the bearings, etc. The vendor manual for the fan recommends cleaning and inspecting the fan blades and screens periodically, in addition to other maintenance recommendations. The licensee had not been performing these recommended maintenance activities, and did not have any documentation to justify their basis for not performing the recommended maintenance. The team noted that the periodic task to clean and inspect the fan blades and screens had also been deleted in 1999 when the plant started eMAX testing.

Analysis. The team determined that the failure to establish a test program to demonstrate that the air flows for the essential service water pump house supply fans were sufficient to keep room temperatures maintained at or below the design basis requirements was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the capability of the essential service water pump house supply fans to perform their safety function of providing 30,000 cfm of air flow was not ensured. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings at Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance.

Enforcement. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," which states, in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Contrary to the above, from 1999 to April 17, 2014, the licensee failed to establish a test program to assure that all testing required to demonstrate that structure, systems, and components will perform satisfactorily in service was identified and performed in accordance with written test procedures. Specifically, the licensee failed to establish a test program to demonstrate that the air flows for Essential Service Water Pump House Supply Fans CGD01A and CGD01B would keep the pump house room temperatures at or below the maximum allowable temperatures when the essential service water pumps are operating during a design basis accident. In response to this issue, the licensee verified that immediate operability was not a concern since the measured parameters (through eMAX and Motor Circuit Evaluator testing) did not indicate poor health or unsatisfactory performance when compared to the fan curve. This finding was entered into the licensee's

corrective action program as Callaway Action Request (CAR) 201402698. Because the finding is of very low safety significance (Green) and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014007-04, "Failure to Establish Essential Service Water Pump House Supply Fan Testing."

.2.15 Refueling Water Storage Tank and Level Transmitters

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, selected drawings, maintenance and test procedures, and Callaway action requests associated with the refueling water storage tank and level transmitters to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Drawings, pictures of the tank uninsulated, and a video of the most recent internal tank inspection.
- Normal and emergency operating procedures.
- Sizing, drain-down, and seismic analysis calculations for the tank.
- Preventive maintenance procedures and results for level transmitters.
- Vendor manual for level transmitters.
- Operating experience and corrective action program documents.

b. Findings:

No findings were identified.

.2.16 Non-Safety related Auxiliary Feedwater Pump (DPAP01)

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with non-safety related Auxiliary Feedwater Pump DPAP01 and associated modification to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- System flow and net positive suction head analyses to verify that the non-safety related pump and associated equipment would perform as required during a loss of all feedwater event.

- The potential impact of the modification on internal plant flooding. Specifically, the potential flooding of the auxiliary feedwater pump valve area.

- Plant operating procedures associated with the non-safety related auxiliary feedwater pump to verify that the pump and associated valves would be operated as required during a loss of all feedwater event.

- Periodic testing procedures and the results of recent periodic tests to verify the current capacity of the installed equipment.

- The minimum flow capacity of the non-safety related auxiliary feedwater pump to verify the capability of the pump to operate under low flow conditions.

b. Findings

No findings were identified.

.2.17 Control Building Heating Ventilation/Air Conditioning (HVAC) Chilled Water System

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with operation of the Control Building Heating Ventilation/Air Conditioning Chilled Water System to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Analysis associated with control building room temperatures after the loss of one train of the control building Heating Ventilation/Air Conditioning system to verify the continued operability of components in the affected areas.

- The maximum temperature difference between the rooms and the inside of electrical cabinets to verify the continued operability of components within the cabinets.

- Plant operating procedures associated with the single failure of a train of the control building Heating Ventilation/Air Conditioning system to verify the required actions are taken in an appropriate time to support the results of the room temperature analysis.

b. Findings

Failure to Adequately Analyze Maximum Electrical Equipment Temperatures Resulting from the Single Failure of Control Building Heating Ventilation/Air Conditioning

Introduction. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to assure that applicable design basis are correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee had failed to account for the temperature differences between inside and outside of electrical cabinets in the Class 1E electrical rooms, as well as the effects of these increased temperatures on the components in the cabinets with a single control building chiller out-of-service in their room heat-up calculations.

Description. During a review of the licensee's Class 1E electrical room heat-up Calculation NAI-1719-001, "Callaway Control Building Loss of Class IE A/C GOTHIC Room Heat Up Analysis," the team identified that the licensee had failed to account for the temperature differences between the inside and outside of electrical cabinets in the Class 1E electrical rooms. This calculation had been performed to support operability of safety-related electrical equipment with a single control building chiller out-of-service, and had been used to support past operability evaluations. Both control building chillers were in service at the time of the inspection. The effects of increased temperatures on the electrical components in the cabinets had not been previously evaluated.

In response to this issue, the licensee performed a preliminary review of the calculation using the GOTHIC analysis to model the temperature within the cabinets. This analysis confirmed the maximum temperature difference between the inside and outside of electrical cabinets was approximately 30 degrees Fahrenheit. An informal evaluation of the most limiting electrical components in these cabinets confirmed that the components would continue to function in the event of an accident with a single control building chiller out-of-service. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201402872.

Analysis. The team determined that the failure to adequately account for increased temperatures within the Class 1E electrical cabinets, and the effect on the components in those cabinets, was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to evaluate the increased temperatures within the cabinets in Calculation NAI-1719-001 could establish non-conservative results that could lead to component failures, causing critical electrical equipment not to function. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to

seismic, flooding, or severe weather. This finding had a cross-cutting aspect, pertaining to identification, in the area of problem identification, because the licensee did not ensure that the organization implements a corrective action program with a low threshold for identifying issues. Individuals identify issues completely, accurately, and in a timely manner in accordance with the program [P.1].

Enforcement. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled." Contrary to the above, prior to April 25, 2014, the licensee failed to establish measures to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee had failed to account for the temperature differences between inside and outside of electrical cabinets in the Class 1E electrical rooms, as well as the effects of these increased temperatures on the components in the cabinets with a single control building chiller out-of-service. In response to this issue, the licensee performed a preliminary review of the calculation and confirmed that the components within the cabinets would continue to function in the event of a transient or accident with a single control building chiller out-of-service. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201402872. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy:
NCV 05000483/2014007-05, "Failure to Adequately Analyze Maximum Electrical Equipment Temperatures Resulting from the Single Failure of Control Building Heating Ventilation/Air Conditioning."

.2.18 Motor Operated Valve (MOV) BNLCV0112E

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with Motor Operated Valve BNLCV0112E, "Centrifugal Charging Pump Suction from Reactor Water Storage Tank Isolation Valve," to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Analysis of the motor operated valve torque to verify the capability of the valve to open and close under the most limiting design basis conditions, including minimum available voltage at the motor terminals.

- Analysis and test results of the maximum differential pressure to verify the capability of the valve to open and close under the most limiting pressure conditions.

- Periodic motor operated valve diagnostic testing, the results of recent tests, and the analysis of test results to verify the continued operability of the valve.

- Periodic inservice test procedures and results of recent tests to verify that the valve stroke times are within the values assumed in accident analyses.

b. Findings

1. Failure To Review Motor Operated Valve (MOV) Data and Complete Analysis of the Data in a Timely Manner

Introduction. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the failure to review motor operated valve diagnostic test data and complete an analysis of the data in a timely manner, as required by procedures. Specifically, by not reviewing the data and completing the analysis of the data in a timely manner could result in safety-related motor operated valves not being able to meet their safety function.

Description. During a review of the diagnostic test results associated with Motor Operated Valve BNLCV0112E, Centrifugal Charging Pump Suction from Refueling Water Storage Tank Isolation Valve, the team determined that data from valve testing performed on September 25, 2013, had not been fully analyzed at the time of the inspection (April 2014). Procedure EDP-ZZ-01114, Motor Operated Valve Program Guide, Section 6.3, “Reports,” Step 6.3.1, states in part: “Within 60 days of MOV Diagnostic Testing, a Test Report shall be completed on the MOV. As a minimum, MOV Engineer: PERFORM a detailed trace analysis and GENERATE the Test Report.” The procedure stated that this test report should include a Signature Analysis Report. In response to this issue, the licensee completed the Signature Analysis Report during the period of the inspection. The results of the analysis, when completed, indicated a declining performance trend because the measured stem coefficient was increasing from the design value of 1.5 to approximately 1.7, decreasing the available torque margin from approximately 23 percent to 7 percent. The licensee confirmed that all of the values in the Performance Report for BNLCV0112E were accurate and that the valve would still function. The licensee also initiated a work order to restore the valve margin. The licensee determined that several other diagnostic test results had not been analyzed in a timely manner. The other diagnostic test results were evaluated and found to be acceptable. This finding was entered into the licensee's corrective action program as Callaway Action Requests (CARs) 201402987 and 201402992.

Analysis. The team determined that the failure to follow Procedure EDP-ZZ-01114 for the timely evaluation of motor operated valve test data was a performance deficiency. This finding was more than minor because if left uncorrected, it would lead to a more significant safety concern. Specifically, by not reviewing motor operated valve data and completing the analysis of the data in a timely manner could result in safety-related

motor operated valves not being able to meet their safety function. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a cross-cutting aspect, pertaining to resources, in the area of human performance, because licensee leaders failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety [H.1].

Enforcement. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "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, between November 2013 and April 2014, the licensee failed to ensure that activities affecting quality were prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and were accomplished in accordance with these instructions, procedures, or drawings. Specifically, the licensee did not follow Procedure EDP-ZZ-01114, Motor Operated Valve Program Guide, Step 6.3.1, as they had not completed a test report for Motor Operated Valve BNLCV0112E, "Centrifugal Charging Pump Suction from Refueling Water Storage Tank Isolation Valve," within 60 days, as required by the procedure. The results of the analysis, when completed, were non-conservative with the measured stem coefficient increasing from the design value of 1.5 to approximately 1.7, decreasing the available torque margin from approximately 23 percent to 7 percent. In response to this issue, the licensee confirmed that all of the values in the Performance Report for BNLCV0112E were accurate and that the valve would still function. The licensee also initiated a work order to restore the valve margin. The licensee determined that several other diagnostic test results had not been analyzed in a timely manner; and evaluated these results which were found to be acceptable. This finding was entered into the licensee's corrective action program as Callaway Action Requests (CARs) 201402987 and 201402992. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014007-06, "Failure To Review Motor Operated Valve (MOV) Data and Complete Analysis of the Data in a Timely Manner."

2. Failure to Adequately Account for Motor Operated Valve Unseating Torque in Torque Calculation

Introduction. The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," involving the failure to adequately account for measured motor operated valve unseating torque in the torque and thrust calculations included in

the Signature Analysis Report. Specifically, the failure to include the valve disc unseating force in the torque calculation could establish non-conservative results that could lead to the valve not to function.

Description. While evaluating the opening and closing requirements of Motor Operated Valve BNLCV0112E, "Centrifugal Charging Pump Suction from Refueling Water Storage Tank Isolation Valve," the team determined that the unseating torque value was recorded on the motor operated valve test data sheet and that the test data sheet did include acceptance criterion for the unseating torque, but this criterion did not include any margin. As a result, the valve could have been returned to service with little or no margin and this condition would not have been discovered when the Signature Analysis Report was completed. The licensee verified that this concern applied to all motor operated gate valves that were subject to unseating torque. In response to this concern, the licensee performed informal analyses based on the most recent test results and verified that all the subject valves were functional. The initial evaluation, based on a design friction coefficient of 0.2, identified four valves with zero or negative margin, however additional evaluation determined these valves were functional. In addition, the team questioned whether the torque associated with unseating should be combined with the torque associated with differential pressure. In response, the licensee has stated that they will investigate the most appropriate way to evaluate both these parameters.

Analysis. The team determined that the failure to include the motor operated valve unseating torque in the calculation of the required torque was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to include the valve disc unseating force in the torque calculation could establish non-conservative results that could lead to the valve not to function. The initial evaluation, based on a design friction coefficient of 0.2, identified four valves with zero or negative margin, however additional evaluation determined these valves were functional. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance.

Enforcement. The team identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," which states, in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Contrary to the above, prior to May 1, 2014, the licensee failed to establish a test program to demonstrate that

structures, systems, and components will perform satisfactorily in service was identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Specifically, the licensee failed to include the motor operated valve unseating torque in the motor operated valve torque calculation. This could establish non-conservative results that could lead to the valve not functioning. In response to this concern, the licensee performed informal analyses based on the most recent test results and verified that all the subject valves were functional. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403034. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy:
NCV 05000483/2014007-07, "Failure to Adequately Account for Motor Operated Valve Unseating Torque in Torque Calculation."

.2.19 Turbine Driven Auxiliary Feedwater Pump "A"

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, system description, the current system health report, selected drawings, maintenance and test procedures, and Callaway Action Requests associated with Turbine Driven Auxiliary Feedwater Pump "A" to ensure design basis requirements and specifications were met. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Auxiliary feedwater system flow and net positive suction head analyses to verify that the safety-related turbine driven auxiliary feedwater pump and associated equipment would perform as required during postulated transient and accident events.

- Analysis of steam generator overfill to verify that the steam generators would not be overfilled by the auxiliary feedwater system during a postulated steam generator tube rupture accident.

- Analysis of the turbine driven auxiliary feedwater pump performance under postulated station blackout events to verify that the pump and associated equipment would perform as required.

- Plant operating procedures associated with the auxiliary feedwater pump to verify that the pump and associated equipment would be operated as required during postulated transient and accident events, including station blackout events.

- Inservice testing procedures and the results of recent inservice tests to verify the current capacity of the installed equipment and to identify any pump degradation.

- The minimum flow capacity of the turbine driven auxiliary feedwater pump, including potential plugging of the minimum flow automatic recirculating control (ARC) valve, to verify the capability of the pump to operate under low flow conditions.

- Internal flooding analyses to verify that the turbine driven auxiliary feedwater pump and associated equipment would not be affected by postulated flooding events.

b. Findings

No findings were identified.

.3 Results of Reviews for Operating Experience

.3.1 Inspection of NRC Information Notice 2013-05: "Battery Expected Life and Its Potential Impact on Surveillance Requirements"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC Information Notice 2013-05 "Battery Expected Life and Its Potential Impact on Surveillance Requirements" to verify that the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address the concerns described in the information notice. This information notice discusses potential problems resulting from conditions that either increased battery design loads or decreased rated battery capacity such that the battery no longer met the sizing design basis. The team verified that the licensee's review adequately addressed the issues in the information notice.

b. Findings

No findings were identified.

.3.2 Inspection of NRC Regulatory Issues Summary (RIS) 2011-12: "Degraded Voltage"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC Regulatory Issues Summary, RIS 2011-12, Revision 1, "Adequacy of Station Electric Distribution System Voltages" to verify the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address concerns. The team verified that the licensee's review adequately addressed the issues in the regulatory issues summary.

b. Findings

No findings were identified.

.3.3 Inspection of NRC Information Notice 2012-06: "Ineffective Use of Vendor Recommendations"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC Information Notice 2012-06, "Ineffective Use of Vendor Technical Recommendations" to verify the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address concerns. The team verified that the licensee's review adequately addressed the issues in the information notice.

b. Findings

No findings were identified.

.3.4 Inspection of NRC Information Notice 2005-30: "Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events and Inadequate Design"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC Information Notice 2005-30 "Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events and Inadequate Design" to verify that the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address the concerns described in the information notice. This information notice discusses potential problems resulting from postulated internal flooding events adversely affecting safety-related components. The team verified that the licensee's review adequately addressed the issues in the information notice.

b. Findings

No findings were identified.

.3.5 Inspection of Callaway Action Request (CAR) 201009243: NRC 2010 Wolf Creek CDBI violation "Inadequate Tornado Damper Testing"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC 2010 Wolf Creek Component Design Bases Inspection 2010007 (ML110100862), violation "Inadequate Tornado Damper Testing" to verify that the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address the concerns described in the associated NRC inspection report. This report discusses potential problems resulting from failure to adequately test tornado dampers installed in safety-related heating ventilation/air conditioning systems. The team verified that the licensee's review adequately addressed the issues in the Wolf Creek NRC inspection report.

b. Findings

No findings were identified.

.3.6 Inspection of NRC Information Notice 2013-18: "Refueling Water Storage Tank Degradation"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC Information Notice 2013-18 "Refueling Water Storage Tank Degradation" to verify that the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address the concerns described in the information notice. This information notice discusses potential problems resulting from flaws in floor welds and floor to tank wall welds of refueling water storage tanks, leading to tank leakage and disruption of plant operations. The team verified that the licensee's review adequately addressed the issues in the information notice.

b. Findings

No findings were identified.

.3.7 Inspection of NRC Information Notice 2012-01: "Seismic Considerations – Principally Issues Involving Tanks"

a. Inspection Scope

The team reviewed the licensee's evaluation of NRC Information Notice 2012-01 "Seismic Considerations – Principally Issues Involving Tanks" to verify that the licensee performed an applicability review and took appropriate corrective actions, if appropriate, to address the concerns described in the information notice. This information notice discusses potential problems resulting from inadequate seismic analyses of tanks, alignment of seismically qualified tanks to nonseismic systems, and various other seismic considerations related to tanks. The team verified that the licensee's review adequately addressed the issues in the information notice.

b. Findings

No findings were identified.

.4 Results of Reviews for Operator Actions

The team selected risk-significant components and operator actions for review using information contained in the licensee's probabilistic risk assessment. This included components and operator actions that had a risk achievement worth factor greater than two or a Birnbaum value greater than 1E-6.

a. Inspection Scope

For the review of operator actions, the team observed operators during simulator scenarios associated with the selected components as well as observing simulated actions in the plant. The selected operator actions were:

- Local manual start of Alternate Emergency Power Supply diesel generators (job performance measure).
- Closing Chemical Volume and Control System Valves LCV-459 or LCV-460 to minimize reactor coolant system losses via letdown during a station blackout event (scenario).
- Opening instrumentation and controls cabinet doors to provide cooling to components used to place and maintain the plant in a safe shutdown condition during a station blackout event (scenario and job performance measure).

b. Findings

Inadequate Procedure For Cooling Instrumentation During a Station Blackout Event

Introduction. The team identified a Green, non-cited violation of 10 CFR Part 50.63(a)(2) for failure to ensure the capability of protection systems during a station blackout, as assumed in the site's station blackout analysis. Specifically, operator actions taken to provide cooling to instrumentation and control cabinets necessary for safe shutdown in a station blackout were not supported by the station blackout analysis. This could result in insufficient cooling to the Solid State Protection System (SSPS) and other essential controls during a station blackout event.

Description. The team reviewed the requirements of 10 CFR Part 50.63, "Loss of All Alternating Current Power," which indicates that licensees are required to develop procedures describing actions taken to cope with a station blackout, and these procedures would need to be supported by an analysis using an acceptable methodology. In letter ULNRC-01973, dated April 12, 1989, the licensee committed to using the analysis methodology described in NUMARC 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors."

As part of developing the analysis using NUMARC 87-00, the user is required to incorporate certain assumptions in event mitigation procedures. In Section 4.2.1(10) of the NUMARC document, it says that "[p]lant procedures should consider loss of ventilation effects on specific energized equipment necessary for shutdown (e.g., those containing internal electrical power supplies or other local heat sources that may be energized or present in a station blackout)." From there, the NUMARC document describes what salient features the procedures need to address. In sub-bullet (d), it states that procedures should address "opening cabinet doors containing instrumentation in control rooms necessary for safe shutdown in a station blackout within 30 minutes ...." Further insight into the expected result of opening these cabinet doors is provided in NUMARC 87-00, Section 2.7(2). With regards to opening the cabinet doors,

it says, “[b]y opening cabinet doors, adequate air mixing is achieved to maintain internal cabinet temperatures in equilibrium with the control room temperature.” By opening the cabinet doors, the internal cabinet temperatures can decrease to be approximately the same as the room, and be maintained in that condition during the station blackout coping period.

The licensee incorporated this assumption into its analysis and procedures. Review of letter ULNRC-01973, dated April 12, 1989, and letter ULNRC-02416, dated May 31, 1991, indicate that site procedures implementing station blackout mitigation actions would require the opening of instrument cabinet doors within approximately 30 minutes of the event. Revision 1 of Procedure OTO-GK-00001, “Loss of Control Room HVAC,” Section 6.3.1, contained directions for opening the cabinet doors for a minimum set of cabinets containing instrumentation and controls relied upon in a station blackout. The procedure directs the operator to open the cabinet doors, but does not specify the number of doors necessary per cabinet to be opened. Therefore, the assumption is that all doors associated with a given cabinet would be opened. Review of station blackout control room ventilation heating calculations assumes that all the heat from all of the cabinets is mixed into the control room air space during the site’s four-hour coping period. Calculation BO-05, Revision 1, “Station Blackout Room Temperature Analysis,” including the addenda, does not define the minimum number of doors that need to be opened. During the inspection, licensed operators were observed performing this procedural task. On two occasions, the licensed operators simulated opening all doors of the listed cabinets.

The assumption that all doors on identified cabinets needed to be opened within 30 minutes was maintained in procedures for use in the event of a station blackout event. EOP Addendum 20, “Control Room Cabinet Door List,” Revision 000, states “[open] the following control room cabinet doors.” The approach was changed on April 15, 2011 when the licensee implemented Revision 003 of EOP Addendum 20. During the revision process, it was decided that opening one door per cabinet would be sufficient to meet the requirement, and this would aid in helping operators complete this task within 30 minutes.

The team evaluated the ability of the licensee operators to implement this procedure. On April 30, 2014, the team observed simulated performance of EOP Addendum 20, Revision 004. Step 1 of this procedure states “[open] at least one door in the following control cabinets.” The team questioned whether opening one door on each cabinet would allow for sufficient cooling of the instrumentation and controls, and how that was evaluated compared to the assumptions identified in the site station blackout analyses. Also, the team observed that different cabinets have different numbers of doors, so the number of doors opened may have different effects on the cooling of the contained instrumentation and controls. Of most concern were the cabinets containing input instrumentation for the Solid State Protection System (SSPS), which provides input to the Reactor Trip System (RTS) and the Engineered Safety Features Actuation System (ESFAS) (cabinets SB029A and SB032A). These two cabinets have eight doors each. If the procedural step was literally implemented, this could result in one of eight doors being opened to each train of solid state protection system instrumentation.

The licensee reviewed the records for the procedure revision, including the supporting station blackout calculations, to see if the decision to direct the operators to open one door per cabinet had been evaluated and documented in 2011. On May 13, 2014, the licensee informed the inspectors that the change made to EOP Addendum 20, Revision 003, had been completed without justifying or documenting what the effects of changing the cabinet door configuration may have on the station blackout analysis. Without an analysis or justification, it could not be determined whether the components in the cabinets would have sufficient cooling with a minimum of one door open during a station blackout. In addition, there was no evidence that an evaluation of the cooling effects for cabinets with eight doors was considered during the procedure change. Documentation associated with a 50.59 screen, conducted for the procedure change, did not have any details describing a review of the site station blackout analysis, nor did it provide any justification for why the change was acceptable when a potentially higher temperature environment may have a negative effect on the components in the cabinets. By not performing an analysis to determine the effect on the temperature of the instrumentation and controls in the cabinets, the licensee may subject the components contained within the identified cabinets to temperatures that could degrade their capability to ensure core cooling and containment integrity. The licensee entered this issue in their corrective action process as Callaway Action Request (CAR) 201403029.

Analysis. The team determined that the failure to ensure that components located in control room cabinets, which provide input for the Solid State Protection System (SSPS) and other essential controls during a station blackout, would remain operable during a station blackout, as assumed in the site's station blackout analysis, was a performance deficiency. This finding was more than minor because it adversely affected the Mitigating Systems Cornerstone attribute of Procedure Quality, and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the change made to EOP Addendum 20, Revision 003, had been completed without documented review of the site's station blackout analysis or its assumptions to justify whether the components in the cabinets would have sufficient cooling with a minimum of one door open per cabinet during a station blackout. By not analyzing the concern to determine the effect of the temperature of the instrumentation and components in the cabinets, the licensee may subject the electronic components contained in the cabinets to temperatures that could degrade their capability to ensure core cooling and containment integrity. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a cross-cutting aspect, pertaining to change management, in the area of human performance, because the licensee had not used a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Without documented results of an analysis or justification, for the 2011 evaluation, the assumptions could not be verified to justify their actions [H.3].

Enforcement. The team identified a Green, non-cited violation of 10 CFR Part 50.63(a)(2) which states, in part, "The reactor core and associated coolant, control, and protection systems, including station batteries and any other necessary support systems, must provide sufficient capacity and capability to ensure that the core is cooled and appropriate containment integrity is maintained in the event of a station blackout for the specified duration." Contrary to the above, from April 15, 2011 to July 2, 2014, the licensee failed to ensure that reactor core and associated coolant, control, and protection systems, including station batteries and any other necessary support systems, would provide sufficient capacity and capability to ensure that the core is cooled and appropriate containment integrity would be maintained in the event of a station blackout for the specified duration. Specifically, a change made to Emergency Operating Procedure Addendum 20, "Control Room Cabinet Door List," Revision 003, required control room operators to open a minimum of one control room cabinet door during a station blackout. Emergency Operating Procedure Addendum 20, Revision 003, was completed without any analysis or calculations performed to justify whether the electronics in the cabinets would have sufficient cooling with a minimum of one door open during a station blackout. This could result in insufficient cooling to the Solid State Protection System (SSPS) and other essential controls during a station blackout. In response to this issue, the licensee initiated actions to make the procedures consistent regarding how many doors should be opened for the given cabinets, and for engineering to investigate how many doors should be opened. This finding was entered into the licensee's corrective action program as Callaway Action Request (CAR) 201403029. Because this violation is of very low safety significance and has been entered into the licensee's corrective action program, the violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000483/2014007-08, "Inadequate Procedure for Cooling Instrumentation During a Station Blackout Event."

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

The team reviewed Callaway Plant corrective action requests associated with the selected components, operator actions, and operating experience notifications. Any related findings are documented in prior sections of this report.

4OA6 Meetings, Including Exit

On May 15, 2014, the team leader presented the preliminary inspection results to Mr. F. Diya, Senior Vice President and Chief Nuclear Officer, and other members of the licensee's staff. On July 2, 2014, the team leader presented the final inspection results to Mr. M. McLachlan, Senior Director Engineering, and other members of the licensee's staff. The licensee acknowledged the findings during each meeting. While some proprietary information was reviewed during this inspection, no proprietary information was included in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
S. Abel, Director, Engineering Projects
N. Akkinapragada, Career Engineer, Design Electrical
F. Bagby, Manager, Work Management Planning
S. Banker, Director, Training
M. Breshears, Engineer, Systems Mechanical
J. Claunch, Career Engineer, Engineering Programs
J. Cortez, Manager, Operations Training
B. Cox, Senior Director, Nuclear Operations
F. Diya, Senior Vice President and Chief Nuclear Officer
L. Eitel, Supervising Engineer, Engineering Systems
T. Elwood, Supervising Engineer, Regulatory Affairs/Licensing
T. Fugate, Director, Maintenance
L. Graessle, Senior Director, Operations Support
M. Haag, Principle Engineer, Design Electrical
D. Hall, Director, Nuclear Oversight
M. Hoehn II, Acting Director, Engineering Programs
B. Huhmann, Supervising Engineer, Design Engineering
A. Hunt, Career Engineer, Engineering Programs
J. Hutchinson, Supervisor, Engineering Design
J. Imhoff, Principal Engineer, Systems Mechanical
B. Jungmann, Director, Planning, Scheduling and Outages
S. Kovaleski, Director, Engineering Design
D. Lantz, Shift Manager, Operations
J. Little, Supervisor, Safety Analysis/Reactor Engineering
S. Maglio, Manager, Regulatory Affairs
D. Martin, Consulting Engineer, Systems Electrical
M. McLachlan, Senior Director, Engineering
S. McLaughlin, Manager, Performance Improvement
S. Meyer, STARS Regulatory Affairs, Ameren
T. Moser, Director, Projects
D. Neterer, Vice President, Nuclear Operations
T. Parashar, Career Engineer, Systems Mechanical
S. Petzel, Engineer, Regulatory Affairs/Licensing
R. Pohlman, Consulting Engineer, Systems Mechanical
G. Reinhard, Consulting Engineer, Electrical Systems Engineering
D. Rickard, Root Cause Coordinator, Ameren – Performance Improvement
L. Sandbothe, Director, Plant Support
E. Smith, Supervisor, Nuclear Oversight
R. Stough, Manager, Operations
S. Taylor, Consulting Engineer, Design Electrical
P. Tella, Career Engineer, Design Electrical
V. Thomas, Supervising Engineer, Engineering Programs
K. Tipton, Supervising Engineer, Systems Mechanical
D. Turley, Acting Director, Engineering Systems
M. Whitehead, Career Engineer, Engineering Programs

L. Wilhelm, Emergency Operating Procedure Coordinator, Operations
T. Witt, Engineer, Regulatory Affairs/Licensing

NRC Personnel
T. Hartman, Senior Resident Inspector
Z. Hollcraft, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2014007-001	NCV	Failure to Establish Adequate Procedures for Testing the Load Tap Changers on Transformers XNB01 and XNB02. (Section 1R21.2.6)
05000483/2014007-002	NCV	10 CFR 50.59 Screen for the Auxiliary Feedwater Motor Operated Control Valves Thermal Overload Relays. (Section 1R21.2.8)
05000483/2014007-003	NCV	Failure to Follow Procedures by Not Identifying a Conflict Between Two Procedures. (Section 1R21.2.13)
05000483/2014007-004	NCV	Failure to Establish Essential Service Water Pump House Supply Fan Testing. (Section 1R21.2.14)
05000483/2014007-005	NCV	Failure to Adequately Analyze Maximum Electrical Equipment Temperatures Resulting from the Single Failure of Control Building Heating Ventilation/Air Conditioning. (Section 1R21.2.17)
05000483/2014007-006	NCV	Failure To Review Motor Operated Valve (MOV) Data and Complete Analysis of the Data in a Timely Manner. (Section 1R21.2.18.1)
05000483/2014007-007	NCV	Failure to Adequately Account for Motor Operated Valve Unseating Torque in Torque Calculation. (Section 1R21.2.18.2)
05000483/2014007-008	NCV	Inadequate Procedure for Cooling Instrumentation During a Station Blackout Event. (Section 1R21.4)

LIST OF DOCUMENTS REVIEWED

Calculations

Number	Title	Revision/Date
57035-M-001	Non-Safety AFW Pump Drawdown from the Condensate Storage Tank	0

Calculations

Number	Title	Revision/Date
57035-M-002	Non-Safety AFW Pump NPSH and Flow Rate Analysis	0
57035-M-003	Non-Safety AFW Pump Analysis and System Resistance Curve	0
AL-14	AFW Flow Generated for MSLB Outside Containment with KYPIPE2	1
AL-17	MSLB, AFW Flow Model Using PIPE2000	1
AL-18	Verification of Adequate Water Inventory for TDAFP Startup after SSE and LOOP without CST Available	1
AL-24	Determine the Effect of Dissolved Nitrogen on the NPSHA for AL Pumps. Determine the Effect on Available NPSH for the Aux Feedwater Pumps	0
AL-24	Determine the Effect of Dissolved Nitrogen on the NPSHa For AL Pumps	0
AL-24 Addendum 4	Evaluate the Potential for Surface Vortex Formation in TAP01	0
AL-26	Suction Pressure for the Motor-Driven Aux Feed Pumps and the Turbine-Driven Aux Feed Pump	0
AL-30	AFW Flow Model Using PIPE2000, Modeling MDAFP & TDAFP	2
AL-35	SGTR Overfill – AFW Flow Model Using PIPE2000	0
AL-57	Air Transport Time to ALV0001 Following a CST Postulated Line Break	0
AL-57	Air Transport Time to ALV0001 Following a CST Postulated Line Break - Identification of Impact of MP 10-0003 - Impact of MP 12-0002	0, Add. 1 & 3
AL-58	AFW System Performance During Small Break Loss of Coolant Accident	0
AP-02 Addendum 3	Required Condensate Storage Tank Capacity Without Credit as the Safety-Grade Shutdown Suction Source for Auxiliary Feedwater	0

Calculations

Number	Title	Revision/Date
AP-05	Calculate the Volume of the Condensate Storage Tank (CST) and The Volume Contained Within The CST at the Alarm and Control Setpoints. Also, Calculate the Level Within the Tank at the Tech Spec Volume Limit.	1
ARC-911	Review of FB and BN System Lines for High Energy Line Break Limits. RWST Valve House Area	0
B-12	Close Circuit Lengths for Callaway Diesel Generator Breakers	0
B-9	DC Control Circuits Voltage Drops	1
BN-16	RWST Drain-down During Transfer to Cold Leg Recirculation	1
BO-01	Station Blackout (SBO) Coping Duration	0
C-151/C-153	Calculation of Qualified Life for EPDM Material in Specification C-151/C-153 (containment door seals)	0
C-1989-130	Seismic Reanalysis of RWST	2
E-21023	System NB Relay Settings and Coordination	22
E-21024	Relay Setting Tab/Coordination Curves Sys NG	8
E-B-10	MCC Control Circuit Voltage Drop	3
E-B-10	MCC CCVD Calculation	3
E-B-10, Addendum 006	MCC Control Circuit Voltage Drop Calculation	03
EG-18	CCW Circulation Time via RHR HX	0
EG-54	Allowable Gas Void Volume for Each Train of the Component Cooling Water Suction Piping	0
EG-55	Water Hammer due to Voids in Component Cooling Water (EG) System Piping	0
M-109-00026	Seismic and Stress Analysis of RWST	2
M-619.2-00049	Seismic Calculation Axial Fan	May 11, 1977

Calculations

Number	Title	Revision/Date
M-619.2-00125	Seismic Analysis for ESW Pumphouse Fan Motor	2
M-GD-234	Cooling and Heating Requirements for the Essential Service Water Pumphouse	1
NAI-1719-001	Callaway Control Building Loss of Class 1E A/C GOTHIC Room Heat Up Analysis	1
NB-05	System NB Protective Relay Setpoints	4
NG-12	NG MCC Setpoint Calculation	3
NG-22	System NG LC Setpoint Calculation	1
NG-23	MCC Setpoint Calculation	0
NK-05	Class 1E Battery Capacity	7
NK-05	Class 1E Battery Capacity	9
NK-10	NK System DC Voltage Drop	2
PK-01	PK11 and PK12 Battery and Charger Sizing	0
PK-01, Addendum 04	PK11 and PK12 Battery and Charger Sizing	0
ULDBD-AL-001	Auxiliary Feedwater System	5
XX-49	Maximum Control Building Flood Level for Room 3101	1
ZZ-145	Short Circuit Calculation	2
ZZ-179	AC Load List	8
ZZ-214	MOV Voltage Drop Calculation	10
ZZ-214	MOV Voltage Drop Calculation	9
ZZ-463	MCC Short Circuit Calculation	2
ZZ-467	MOV High Torque-High Voltage Conditions	0
ZZ-536	Rising Stem MOV Capability and Margin Calculation	1

Calculations

Number	Title	Revision/Date
ZZ-548	AEPS Protective Relay Settings	0
ZZ-549	AEPS Load Flow Calculation	1
ZZ-62	Plant Load Flow Calculation	9
ZZ-62, Addendum 3	Plant Load Flow Calculation – High Voltage Limit Acceptance Criteria for NG07F and NG08F	9

Callaway Action Requests (CARs)

199400370	201104353	201203135	201300587	201306710
199903704	201104353	201203302	201301102	201306816
200306202	201104782	201203302	201301151	201306866
200404269	201105599	201203302	201301186	201306867
200405610	201105700	201204144	201301635	201306936
200408062	201105793	201204144	201301962	201306936
200409052	201106093	201204161	201302824	201307147
200506877	201106180	201204890	201302880	201307763
200908300	201106551	201204940	201303200	201309139
201008475	201104251	201205193	201303691	201400808
201009243	201107398	201206131	201304800	201400962
201010145	201110202	201206233	201306278	201401204
201011161	201110469	201206539	201306298	201401724
201011278	201200050	201206733	201306420	201402164
201100626	201200577	201206751	201306459	201402361
201101306	201200905	201206753	201306459	201402889
201102588	201201353	201206831	201306559	201403005
201102619	201202157	201207436	201306681	201402937
201102894	201202410	201208867	201309341	201403120
201103272	201203020	201208984	201309597	201403022
201103501	201203098	201303782	201309597	201403024
201103686	201203106	201304731	201309694	201403029
201103882	201205863			

Callaway Action Requests (CARs) Initiated During Inspection

201400457	201402658	201402699	201402992	201403055
201402604	201402659	201402801	201403034	201403113

Callaway Action Requests (CARs)

201402617	201402668	201402827	201403036	201403282
201402618	201402688	201402872	201403046	201403369
201402635	201402698	201402987		

Design Basis Documents

Number	Title	Revision
EE-001	MV & LV AC & LV DC Overcurrent Protection Coordination	4
EE-006	Electrical Design Criteria	4
ULDBD-AL-001	Auxiliary Feedwater System	5
ULDBD-EF-001	Essential Service Water	1
ULDBD-EG-001	Component Cooling Water	1
ULDBD-GD-001	Essential Service Water Pumphouse and Ultimate Heat Sink Ventilation Systems	1
ULDBD-NB-001	Lower Medium Voltage (Class 1E 4.16 KV)	001

Design Change Package:

Number	Title	Date
FSARCN 08-012	Changes to FSAR 8.3.1.1.2e	June 25, 2008

Drawings

Number	Title	Revision
D-76-81	Refueling Water Storage Tank	7
D-76-83	Details – Refueling Water Storage Tank	5
E-009-00007	152 Internals	9
E-012.2-019-04	CCW Pump Motor Speed/Torque Current	0
E-012.2-031-2	ESW Pump Motor Speed/Torque Current	0
E-018-00176	MCC NG03D Layout	26
E-03NE11	4.16KV DG NE02 Feeder Breaker 152NB0211	13

Drawings

Number	Title	Revision
E-1044-00011	XNB02 LTC Transformer Nameplate	0
E-21001	Main Single Line Diagram	23
E-21032	Transformer Tap Settings	4
E-21NB02	4.16kV NB02 Single Line	13
E-21NG02	480V MCC NG02 Single Line	26
E-21NG02	LV 480V NG-04 Single Line	25
E-21NK02	Class 1E 125V DC System Meter & Relay Diagram	8
E-23EF02	ESW to SW System Isolation Valve EFHV23	17
E-23EF02A	ESW to SW System Isolation Valves	13
E-23EF02B	ESW to SW System Isolation Valves	4
E-23EF03B	ESW to SW System Isolation Valve EFHV39	1
E-23EF03C	ESW to SW System Isolation Valve EFHV41	0
E-23NB04	Class 1E 4.16 KV Three Line Meter and Relay Diagram	6
E-23NB06	Class 1E 4.16 KV Three Line Meter and Relay Diagram	8
E-23NB15	Class 1E Bus NB02 Feeder Breaker. 152NB0212	8
E-23NE02	Standby Generation System Three Line Meter and Relay Diagram	12
E-23NE11	4.16 KV DG NE02 Feeder Breaker 152NB0211	13
EF-1	ESW (LP-05)	2
EG-2	CCW (LP-10)	1
E-U1NG01	Class 1E 480V Single Line Meter and Relay Diagram	13
M-021-00178	Non-Safety Auxiliary Feedwater Pump 200-Orifice Assembly	0
M-109-00004	Details – Refueling Water Storage Tank	8

Drawings

Number	Title	Revision
M-22AB02(Q)	P&ID – Main Steam System	17
M-22AL01(Q)	P&ID – Auxiliary Feedwater System	43
M-22AP01	Condensate Storage and Transfer System	28
M-22AP01	P&ID – Condensate Storage and Transfer System	28
M-22BG03(Q)	P&ID – Chemical and Volume Control System	55
M-22BN01(Q)	P&ID – Borated Refueling Water Storage System	25
M-22EG01	Component Cooling Water System	10
M-22EM02(Q)	P&ID – High Pressure Coolant Injection System	20
M-22FC02(Q)	P&ID – Auxiliary Feedwater Pump Turbine	24
M-23EF01(Q)	Essential Service Water System Control Bldg (A&B) Train	25
M-23EG01	Component Cooling Water Sys. Aux. Bldg. “A” Train	6
M-23EG02	Component Cooling Water Sys. “A” Train to Fuel Bldg.	0
M-23EG03	Component Cooling Water Sys. Aux. Bldg. “B” Train	7
M-23EG04	Component Cooling Water Sys. Aux. Bldg. “B” Train	3
M-23EG08	Component Cooling Water Sys. Surge Tank Area	2
M-23EG18	Component Cooling Water System Fuel Building	1
M-23EG22	Component Cooling Water System Auxiliary Building Location 141	7
M-627A-00128	Schedule for Tornado Dampers	9
MS-2	Piping Class Sheet Class HBC	82
MS-2	Piping Class Sheet Class HBC	86
M-U2EF01	Essential Service Water System	65
OTN-MD-00001	Switchyard One Line Diagram	26

Procedures

Number	Title	Revision
12504722.510	EMAX Testing Instructions for DCGD01A/B	0
APA-ZZ-00101	Processing Procedures, Manuals, and Desktop Instructions	42, 64
APA-ZZ-00395	Significant Operator Response Timing	22
APA-ZZ-00395	Significant Operator Response Timing	0
APA-ZZ-00500	Corrective Action Program	60
APA-ZZ-00500	Operability and Functionality Determinations	21
APA-ZZ-00500 Appendix 12	Significant Adverse Condition - Significance Level 1	20
APA-ZZ-00600	Design Change Control	50
CDP-ZZ-00200	Chemistry Schedule and Water Specs	92
E-0	Reactor Trip or Safety Injection	16
E-1	Loss of Reactor or Secondary Coolant	17
E-2	Faulted Steam Generator Isolation	10
EC Supp Guide	Emergency Coordinator Supplemental Guideline	13
ECA-0.0	Loss of All AC Power	17
ECA-0.0	Loss of All AC Power	017
ECA-0.0	Loss of All AC Power	5
EDP-ZZ-01114	Motor Operated Valve Program Guide	26
EDP-ZZ-01126	Lubrication Predictive Maintenance Program	6, 16
EOP Addendum 19	Aligning ESW to AFW Suction	3
EOP Addendum 19	Aligning ESW to AFW Suction	3
EOP Addendum 20	Control Room Cabinet Door List	4
EOP Addendum 20	Control Room Cabinet Door List	0

Procedures

Number	Title	Revision
EOP Addendum 23	Local CST Emergency Fill	3
EOP Addendum 38	Non-Safety Related Auxiliary Feedwater Pump	6
EOP Addendum 38	Non-Safety Auxiliary Feedwater Pump	6
EOP Addendum 39	Alternate Emergency Power Supply	5
EOP Addendum 40	UHS Cooling Tower Fan Speed and Bypass Valve Control	0
ES-1.3	Transfer to Cold Leg Recirculation	11
FPP-ZZ-00009 Appendix 2	Retraining Courses and Activities	13
ISF-BN-0L931	RWST Level Protection Ch II COT	16
ISL-BN-0L931	RWST Level Channel Calibration Protection 2(B)	18
ISL-NF-NB02A	Degraded & UV to LSEL Channel Test	26
ISP-NF-02450	UV Time Response Testing – Train B	4
ISP-SM-LL0L1	Containment Personnel Access Hatch and Emergency Access Hatch Door Seal Leak Rate Test	10
ISP-SM-LL0L4	Containment Personnel Hatch Shaft Seal Leak Rate Test	5
MDP-ZZ-0STOR	Staging and Storage of Materials, Equipment & Tools within the Switchyard, Under the Electric Distribution Lines, Protected Area, and Power Block	14
MPE-PK-NB001	Battery Performance Discharge Test	10
MPE-ZZ-NB001	Monthly Inspection of Large Non-Safety Related Stationary Batteries	14
MPE-ZZ-NB002	Quarterly Inspection of Large Non-Safety Related Stationary Batteries	13
MPE-ZZ-NB005	Intercell Connection Inspection and Testing of Non-Safety Related Station Batteries	9
MPE-ZZ-QS005	GE 4.16KV Breaker PM	34
MPE-ZZ-QS009	Testing of MCC Breakers, Starters, TOL Relays	30
MPE-ZZ-QS012	GE AKR 30/50 Circuit Breaker Overehaul Procedure	15

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Number	Title	Revision
MPE-ZZ-QS015	4.16KV Square D Vacuum Breaker PM	4
MPE-ZZ-QY136	Operational Test – Cap Bank NB04	5
MSE-NB-QY005	Degraded Voltage Relay Timing Test	7
MSE-NK-QB014	Refueling Outage Inspection and Surveillance of NK14 Battery and Battery Charger NK24/NK26	21
MSE-NK-QB01D	Weekly Inspection of NK14 Large Stationary Batteries	13
MSE-NK-QD02D	Quarterly Surveillance on NK14 Large Stationary Batteries	16
MSE-ZZ-QS001	MCC Cleaning and Inspection	30
MSE-ZZ-QS002	GE AKR 30/50 Circuit Breaker Preventative Maintenance and Inspection	36
MTE-ZZ-QN006	Addendum C, EMAX Testing of 480V Motors	0
ODP-ZZ-00025	EOP/OTO User's Guide	25
ODP-ZZ-0016E	Operations Technicians Watchstation Practices and Rounds	30
OSP-AL-P0002	Turbine Driven Aux Feedwater Pump Inservice Test – Group B	72
OSP-AL-PV005	Turbine Driven Auxiliary Feedwater Pump and Check Valve Inservice Test - IPTE	13
OSP-AL-PV04A	Train A Motor Driven Auxiliary Feedwater Pump Comprehensive Pump and Check Valve Test	16
OSP-EF-V001A	ESW Train A Valve Operability	40
OSP-SA-2413B	Train B Diesel Generator Sequence Testing	19
OTA-RK-00014, Addendum 7F	Alternate Emergency Power Trouble	2
OTN-AL-00001, ADD 01	Turbine-Driven Auxiliary Feedwater Pump Trip/Throttle Valve Trip Check and Reset	4
OTN-AP-00001	Condensate Transfer and Storage System	12
OTN-AP-00002	Condensate Storage Tank Deoxygenation	13
OTN-BG-00002	Reactor Makeup Control and Boron Thermal Regeneration System	44

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Number	Title	Revision
OTN-BN-00001	Borated Refueling Water Storage System	6
OTN-EF-00001	Essential Service Water System	67
OTN-EG-00001	Component Cooling Water System	57
OTN-GK-00001	Control Building HVAC System	42
OTN-NB-0001B Add 1	Transformer XNB02 LTC Operations	7
OTN-NB-0001B Add 5	NB02 Loss of Power Recovery	0
OTN-NB-0001B Add2	Capacitor Bank NB04 Operations	6
OTN-PA-00002	Loss of COOP Power to PA501 and PB05	7
OTO-GK-00001	Loss of Control Room HVAC	13
OTO-GK-00001	Loss of Control Room HVAC	13
OTO-GK-00001	Loss of Control Room HVAC	1
OTO-GK-00001	Loss of Control Room HVAC	7
OTO-SK-00003	Extensive Damage Mitigation Guidelines (EDMGS)	5
OTO-ZZ-00001	Control Room Inaccessibility	39
OTS-AP-00001	Non-Safety Auxiliary Feedwater Pump Testing and Operation	4
PM0815479	Clean/Inspect XNB02	0
PM1001510	Functional Test of XNB02-XFMR LTC	0

Work Orders

S673816	10507935	11513497	12509114	13507438
12002313	10509134	11513817	12511640	13507453
222181	10513847	11513939	12512543	13509131
04502797	11500170	11514421	12513667	13509170
06519858	11504967	11514856	13002010	13509668

07505983	11505701	12500891	13501483	13511453
08504109	11507058	12502659	13502941	13512217
08509742	11508660	12504193	13502941	13513594
08511059	11510515	12504336	13503199	14001993
09006537	11512701	12504744	13505334	14500342
09504613	11513435	12505982	13506585	14502690
10507293	11513485	12507539	13506856	

Miscellaneous

Number	Title	Revision/Date
	Bolting Manual	013
	Pilot Cell Selection 2013-2014	
	Health Report Executive Summary 3Q13 – Component Cooling Water (EG)	
	Vibration and Offline Motor Testing Data DCGD01A	September 2010 – October 2013
	ESW Pumphouse Temperature Trend Data	July 16-18, 2013
	Pictures of RWST Uninsulated	February 2000 – June 2002
	Video for Job 08511059 – Internal Inspection RWST	April 25, 2013
	EMAX test results for DCGD01A/B	March 1999 – November 2013
	List of Maintenance on CGD01A/B	1993-2014
	Completed ESW Pump A Test, OSP-EF-P001A Rev. 67	February 26, 2014
	RWST Temperature Trend Data	April 2011 – May 2014
	RWST Level Bistable Trend Data	March 2005 – December 2013
	RWST Level Calibrate Loop Trend Data	July 2005 – April 2014
	Completed PMs for CGD01A/B (voltage, amps, and static pressure)	January 1994 – October 1997
	Callaway Plant Operating Quality Assurance Manual (OQAM)	30

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Number	Title	Revision/Date
1019517	Nuclear Maintenance Applications Center: Oil Lubrication Guide for Rotating Equipment	December 2009
1019518	Nuclear Maintenance Applications Center: Lubrication Guide	4
10446-M-235	Design Specification for 150-Pound Butterfly Valves	8
10466-M-109	Design Specification for Furnishing, Erecting, and Testing of Steel Field Erected Tanks for the Standardized Nuclear Unit Power Plant Systems (SNUPPS)	7
136072	Instruction Manual for PAP01	1
19921028-01	Letter from L. Raynard Wharton, U.S. Nuclear Regulatory Commission, to Donald F. Schnell, Senior Vice President – Nuclear, Union Electric, "Callaway Nuclear Plant – Safety Evaluation of the Response to the Station Blackout Rule, 10 CFR 50.63 (TAC No. M68524)."	October 23,1992
AUCA 11-056	Root Cause Analysis for CAR 201106551	September 29, 2011
BLWE 1525	RWST Level Setpoints for SNUPPS	October 26, 1981
BNLCV0112E	MOV Signature Analysis Report	October 23,2007
C-151-01200	Instruction Manual for Airlocks and Closures	6
CA-2112	Fire Brigade Equipment Inventory and Condition Checklists	January 13, 2014
CA-2172	Engineering Change Review Notification	April 11, 2014
CS-43-GD01	Callaway Startup Field Report ESW HVAC	0
DPEF01B	B ESW Pump Motor Lower Bearing Oil Analysis Data Sheet Report	April 8, 2014
E-050-00016	Instruction Manual for Batteries and Battery Racks	14
E-1038-00009	Aging Analysis Report for 7.5 KVA Class 1E Inverter/ Bypass Transformer	0
E-1038-00013	Final Test Report for 7.5 KVA Class 1E Inverter/ Bypass CVT	0
E-1044-00001	Vendor Manual – Beckwith LTC Controller - Liquid Immersed Transformers	0

Miscellaneous

Number	Title	Revision/Date
E-1056	Repair and Reconditioning Specification for Medium Voltage AC Motors	0
EG-M-040	Evaluation for the Maximum Void Fraction and Transient Duration to Preclude Pump Mechanical Damage for the Component Cooling Water (CCW) EG System	0
EMPRV Database 6362084	Gasket, Spiral Wound	
FAI/09-130	Technical Basis for Gas Transport to the Pump Suction	December 2009
FPP-ZZ-00009 Appendix 2	Retraining Courses and Activities	13
FSARCN 08-012	Thermal Overload Relays Not Bypassed for ALHV0005, 7, 9, and 11	June 25, 2008
GLDS-0028	Installation, Operation, and Maintenance Instructions	3
I000000282678	Preventive Maintenance Request Abbreviated – Delete PMs on CGD01A	April 26, 1999
IM-LGSB13-1, Section 2.0 only	Instruction Manual for LGSB13 Type Circuit Breaker	3
J-1011-00001	Instruction Manual for Aphaline Model 1152 Pressure Transmitters (Rosemount)	9
Job Number 13514437	Fire Brigade Equipment Inventory and Condition	January 13, 2014
M-082-00039	Instruction Manual for Component Cooling Water Pumps	21
M-109-00099	Instruction and Operating Manual for CST Floating Cover	3
M-619.2-00136	Instruction Manual for Safety-Related Fans	7
MP 10-0032	Installation of Non-Safety Auxiliary Feedwater Pump	0
MTE-ZZ-QA014	Limit Controlled MOV Test Criteria Worksheet for BNLCV0112E	September 25, 2013
N/A	Quarterly Plant Health Report	January 30, 2014
N/A	Summary Report on the 5b Interim Update of the Callaway Level 1 PRA	October 2013
NEI 09-10	Guidelines for Effective Prevention and Management of System Gas Accumulation	1
PM 1007547	Overhaul Essential Service Water Pump A Motor	

Miscellaneous

Number	Title	Revision/Date
PM1007364	B Train Floor Drain Inspections	0
Reg. Guide 1.155	Station Blackout	August 1988
RERP Appendix J	Callaway Plant On-Shift Staffing Analysis Report	000
RFR 201104353	Class 1E Electrical Equipment Survivability	0
RFR 201104353	Class 1E Electrical Equipment Survivability	0
RFR 201304692	Technical Evaluation for Adjusting ESW Motors Shaft Axial End Play	December 19, 2013
RFR 201304731	Evaluation of Wire Mesh for Maximum Drain Rates	0
RFR 21897	Evaluate Hydrazine Addition to the CST	A
RFR 8746	Determine Thrust Values Using Close Calibration	G
Scenario # 2014 CDBI 01	2014 NRC CDBI Simulator Scenario	00
T61.003B 6	Control Board Certification, Off Normal Procedures B-18, OTO-GK-00001, Loss of Control Room HVAC	February 18, 2012
T61.003D/T61.0520	Control Board Certification – Emergency Procedures D-22 ECA-0.0, Loss of All AC Power	October 25, 2012
ULDBD-AL-001	Auxiliary Feedwater System	005
ULDBD-EA-001	Service Water	001
ULDBD-EF-001	Essential Service Water	001
ULDBD-GD-001	Essential Service Water System Pumphouse and Ultimate Heat Sink Ventilation Systems	001
ULNRC-01973	Letter from Donald F. Schnell, Senior Vice President Nuclear, Union Electric, to U.S. Nuclear Regulatory Commission, “Docket Number 50-483, Callaway Plant, Station Blackout, NRC TAC No. 68524.”	April 12, 1989
ULNRC-02182	Letter from Donald F. Schnell, Senior Vice President Nuclear, Union Electric, to U.S. Nuclear Regulatory Commission, “Docket Number 50-483, Callaway Plant, Station Blackout, NRC TAC No. 68524.”	March 29, 1990
ULNRC-02416	Letter from Donald F. Schnell, Senior Vice President Nuclear, Union Electric, to U.S. Nuclear Regulatory Commission, “Callaway Plant, Docket Number 50-483, Station Blackout.”	May 31, 1991

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Number	Title	Revision/Date
ULNRC-02662	Letter from Donald F. Schnell, Senior Vice President Nuclear, Union Electric, to U.S. Nuclear Regulatory Commission, “Callaway Plant, Docket Number 50-483, Callaway Station Blackout Submittal.”	July 10, 1992
ULNRC-02964	NRC Letter – Safety-Related Motor Operated Valve Testing and Surveillance	February 18, 1994
ULNRC-04430	NRC Letter – Periodic Verification of Design Basis Capability of Safety-Related Motor Operated Valves	March 30, 2001
ULNRC-05270	60 Day Response to NRC GL 2006-02	March 31, 2006
ULNRC-05313	Follow-up Response to NRC GL 2006-02	August 1, 2006
ULNRC-05362	Response to NRC RAI Regarding GL 2006-02	January 31, 2007
ULNRC-1701	Letter to NRC, Response to NRC Inspection Report No’s 50-483/87033 & 50-483/87035	December 22, 1987
UTFL-0001	Ultraflote Corporation Cover Operating Manual	July 9, 2002
UTFL-0002	Ultraflote Corporation Internal Cover Erection Manual	October 1, 1989
UTFL-0003	Ultraflote Corporation Cover Dimensions	August 15, 2002

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Sincerely,

/RA/

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

Docket Nos.: 50-483
License Nos.: NPF-30

Enclosure:
Inspection Report 05000483/2014007,
w/Attachment: Supplemental Information

cc w/encl:
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Letter to Fadi M. Diya from Thomas R. Farnholtz dated July 31, 2014

SUBJECT: CALLAWAY PLANT-NRC TRIENNIAL BASELINE COMPONENT DESIGN BASES INSPECTION NRC INSPECTION REPORT 05000483/2014007

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