

Callaway

3Q/2011 Plant Inspection Findings

Initiating Events

Significance:  Jun 23, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Correctly Implement a Plant Safety System Test Procedure

A self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," was identified when the licensee's failure to correctly follow a test procedure resulted in a negative reactivity excursion due to excessive boration. On May 27, 2011, with the Callaway Plant at 100 percent power, maintenance was in progress to perform a functional test of the plant's safety system trip actuating devices. During the test the instrument maintenance technicians failed to place the mode selector switch in the "test" position. This resulted in switching the charging pump suction from the volume control tank to the refueling water storage tank. The inadvertent actuation resulted in a reactivity excursion that required lowering main turbine power and reactor power to about 92 percent. The crew stabilized the plant and returned critical parameters to their normal control bands. The licensee entered this issue in the corrective action program as Callaway Action Request 201104451.

This finding is more than minor because it was associated with the configuration control attribute of the Initiating Events Cornerstone and affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance since it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment or functions will not be available. This finding had a cross-cutting aspect in the area of human performance associated with the work practices component because the instrument maintenance technicians failed to adequately use human error prevention techniques, such as self- and peer-checking to ensure that work activities are performed safely

Inspection Report# : [2011003](#) (*pdf*)

Mitigating Systems

Significance:  Sep 23, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Correctly Implement Plant Maintenance Procedures

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to correctly follow maintenance procedures which resulted in a failure of motor-operated valve EFHV0065 associated with the ultimate heat sink train A cooling tower. To perform its safety function the valve must be capable of being closed. On September 15, 2010, the mechanical maintenance department removed and rebuilt the actuator for the motor-operated valve. The valve actuator stop nuts were not set correctly and remained set outside the range of the electrical limits due to electrical maintenance workers failing to complete the procedure and work instructions initiated by the mechanical department. On June 22, 2011, an attempt to manually align essential service water return over the train A safety-related cooling tower failed when the motor-operated valve was manually positioned past the zero percent open position due to the improperly set stop nuts. This disengaged the valve operator worm from its worm gear, opened the valve, and rendered the valve being incapable of being closed. The immediate corrective action to replace the valve actuator was completed on June 23, 2011. The licensee initiated Callaway Action Request 201105074 to evaluate cause and extent-of-condition and specify corrective actions.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating

Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was of very low safety significance because it did not create a loss of system safety function of a single train for greater than the technical specification allowed outage times, and did not affect seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of human performance associated with the work controls component because the mechanical and electrical maintenance technicians failed to adequately maintain interfaces to communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance.

Inspection Report# : [2011004](#) (pdf)

Significance:  Sep 23, 2011

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Evaluate Breaker Relay Settings Results in Partial Loss of Station Blackout Response Capability

The inspectors reviewed a self-revealing finding for the failure of AmerenUE engineering personnel to correctly establish the relay settings for the alternate emergency power supply diesel output breakers. On August 21, 2011, Callaway Plant experienced a loss of power to the alternate emergency power supply diesel bus PA05. This resulted in all four alternate emergency power supply diesels starting; however, the number three diesel output breaker immediately tripped open. The licensee determined that the breaker's protective relaying was improperly set. Further investigation by AmerenUE discovered that all four of the diesel output breakers had incorrect settings. The incorrect settings occurred due to the limited range of the relay chosen for the application and the engineering recommendations that prioritized protecting the diesel over limiting the margin to unintended breaker trips. Callaway engineering reviews had not identified the low margin to unintended trips. The licensee initiated corrective actions associated with Callaway Action Request 201106701 to change the differential current relay settings.

This finding is more than minor because it is associated with the design control attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding is of very low safety significance because it was a design deficiency that did not result in a loss of system safety function, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant per 10 CFR 50.65, for greater than 24 hours, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution because the licensee failed to implement a corrective action program with a low threshold for identifying issues commensurate with their safety significance.

Inspection Report# : [2011004](#) (pdf)

Significance:  Jun 23, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain an Adequate Flooding Analysis for Room 3101

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," after the licensee failed to provide adequate design control measures for verifying the adequacy of the flooding analysis associated with the 2009 modification that replaced essential service water carbon steel piping with high density polyethylene piping. The licensee did not update the flooding analysis of record to consider potential failures in the new piping. The licensee generated Callaway Action Request 201102957 to develop a means to evaluate the relative stresses associated with the new pipe.

This finding was determined to be greater than minor because it impacted the Mitigating Systems Cornerstone attribute of design control and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding required a Phase 2 significance determination. Using the presolved worksheet from the "Risk Informed Inspection Notebook for the Callaway Station," Revision 2.01a, the finding was red, which warranted further review. Therefore, a senior reactor analyst performed a bounding Phase 3 significance determination. The bounding change to the core damage frequency was

approximately 4.1E-7 (Green). This was impacted significantly by the very small amount of new piping in the room. This finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution associated with the corrective action component in that the licensee did not thoroughly evaluate the extent of condition when the residents challenged the flooding calculation in December 2010 such that the resolutions addressed causes and extent of conditions, as necessary

Inspection Report# : [2011003](#) (pdf)

Significance:  Jun 23, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Analyze Refueling Water Storage Tank Level Transmitters for High-Energy Line Break

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to adequately evaluate a potential high-energy line break in nonseismically qualified auxiliary steam piping in the refueling water storage tank valve house. The harsh environment from a high-energy line break had the potential to impact safety related level transmitters associated with the refueling water storage tank. Following identification of this issue by the inspectors, the licensee analyzed the nonnuclear auxiliary piping to ensure it could withstand safe shutdown earthquake loadings which allowed high-energy line breaks at intermediate locations to be excluded. This issue was entered into the licensee's corrective action program as Callaway Action Request 201102588.

This finding is greater than minor because it is associated with the Mitigating Systems Cornerstone attribute of design control and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding is determined to be of very low safety significance since subsequent evaluation concluded the issue was a design or qualification deficiency confirmed not to result in loss of operability or functionality. This finding did not have a cross-cutting aspect since the error associated with the high-energy line break analysis was not reflective of current licensee performance.

Inspection Report# : [2011003](#) (pdf)

Significance:  Mar 24, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Document Reasonable Expectation of Operability for Equipment Supported by the Class 1E Air Conditioning Units

The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for failure to adequately evaluate past operability associated with the Class 1E electrical equipment air conditioning unit. The inspectors identified that Revision 1 and 2 to Callaway Action Request 200800615 incorrectly concluded that the equipment supported by the Class 1E electrical equipment air conditioning unit train B was operable with the unit's cooling water flow control valve in manual. This issue was entered into the licensee's corrective action program as Callaway Action Request 201102565.

This finding was determined to be greater than minor because it impacted the Mitigating Systems Cornerstone attribute of human performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding screened to a Phase 2 significance determination because it involved the loss of one train of safety related equipment for longer than the technical specification allowed outage time. A Region IV senior reactor analyst performed a bounding Phase 3 significance determination and determined that the finding was of very low safety significance (Green). The very short exposure period coupled with the availability of train A equipment helped to mitigate the significance. The dominant core damage sequences included a loss of main feedwater initiating event; the loss of train B electrical power; and various failures of auxiliary feedwater. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions including verifying the validity of the underlying assumptions when performing operability/reportability evaluations.

Inspection Report# : [2011002](#) (pdf)

Significance: SL-IV Mar 24, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Report Inoperability of Class 1E Electrical Equipment for a Period Greater than Allowed by the Plant's Technical Specifications

The inspectors identified a IV noncited violation of 10 CFR 50.73(a)(2)(v), "Licensee Event Report System," for failure to report inoperability of Class 1E electrical equipment for a period greater than allowed by the plant's technical specifications. The licensee determined there were no prior instances where the Class 1E electrical equipment air conditioning units were inoperable greater than the technical specification allowed completion time of the supported equipment. The inspectors reviewed the licensee's reportability evaluation and identified that the event described in Callaway Action Request 200800615 resulted in a period where the Class 1E electrical equipment air conditioning unit train B was inoperable for approximately 37 hours which exceeded the technical specification allowed completion time of the equipment supported by the Class 1E electrical equipment and constituted a condition which was prohibited by the plant's technical specifications and should have been reported in a licensee event report. This issue was entered into the licensee's corrective action program as Callaway Action Request 201011132.

This finding affects the Mitigating Systems Cornerstone and is greater than minor because in order to perform its regulatory function, the NRC relies on licensees to identify and report conditions or events meeting the criteria specified in the regulations. Because this issue affected the NRC's ability to perform its regulatory function, it was evaluated using the traditional enforcement process. Consistent with the guidance in Section 6.9, Paragraph d.9, of the NRC Enforcement Policy, this finding was determined to be a Severity Level IV noncited violation. This finding has no crosscutting aspect as it was strictly associated with a traditional enforcement violation.

Inspection Report# : [2011002](#) (pdf)

Significance:  Mar 24, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Containment Spray Test Procedure Potentially Creates an Unanalyzed Condition

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for failure to provide adequate procedural guidance for testing of containment spray pumps. The inspectors reviewed a licensee evaluation of the acceptability of their existing containment spray pump testing procedure and found that it failed to adequately address the underlying technical issues because it relied on operators recognizing the diversion flow path and focused on the operability of the containment spray system and not the ability to maintain the long term cooling function of the emergency core cooling system. Additionally, the inspectors identified that the procedure would have provided a diversion flow path of post-accident sump fluids back to the refueling water storage tank exceeding those currently analyzed in the Callaway licensing bases. This issue was entered into the licensee's corrective action program as Callaway Action Request 201011233 and the licensee implemented procedure changes to address the potential for post-loss of coolant accident containment sump fluids being injected back to the refueling water storage tank.

This finding was determined to be greater than minor because it impacted 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.

The finding screened to a Phase 2 significance determination because it involved a potential loss of safety function. A Region IV senior reactor analyst performed a bounding Phase 3 significance determination and determined that the finding was of very low safety significance (Green). The very short exposure period coupled with the availability of equipment needed for other initiating events (other than small and medium loss of coolant accidents) helped to mitigate the significance. The dominant core damage sequences included small and medium break loss of coolant accidents, and the failure of emergency core cooling pumps in the recirculation mode. This finding was determined not to have a crosscutting aspect since the performance deficiency is not reflective of current performance.

Inspection Report# : [2011002](#) (pdf)

Significance:  Mar 24, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Scaffolding Installation Inadequacy

The inspectors identified a noncited violation of Technical Specification 5.4.1.a for failure to properly implement Procedure MDP-ZZ-S0001, "Scaffolding Installation and Evaluation," Revision 26, when scaffolding was erected near or in contact with equipment in safety-related structures. On February 8 and March 16, 2011, the inspectors identified two locations where scaffold poles and a scaffold pin were less than the procedure required 1 inch from the auxiliary building vent line, the Train B emergency diesel lube oil drain line, and also essential service water system piping in the Train B diesel room. This issue was entered into the licensee's corrective action program as Callaway Action Request 201102091.

The deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. The finding was associated with the Mitigating Systems Cornerstone. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue is determined to have very low safety significance because the finding is not a design or qualification issue confirmed to result in 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 nontechnical specification equipment; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the cause of the finding has a crosscutting aspect in the area of problem identification and resolution associated with the component of corrective action program because the licensee did not have a low threshold for identifying scaffold issues.

Inspection Report# : [2011002](#) (*pdf*)

Significance: SL-IV Mar 18, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Update the Updated Safety Analysis Report

The team identified a Severity Level IV, noncited violation of 10 CFR 50.71, "Maintenance of records, making of reports," paragraph (e) which states, in part, "Each person licensed to operate a nuclear power reactor shall update periodically the updated safety analysis report originally submitted as part of the application for the license, to assure that the information included in the report contains the latest information developed." Specifically, the licensee incorporated numerous errors in the updated safety analysis report associated with the descriptions of the onsite electrical power systems. The licensee has entered this violation into their corrective action program as Condition Reports 201101335 and 201102064.

The inspectors determined that the failure to update the updated safety analysis report as required by 10 CFR 50.71(e), "Maintenance of records, making of reports" 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. The inspectors used the NRC Enforcement Policy, dated September 30, 2010, to evaluate the significance of this violation. Consistent with the NRC Enforcement Policy, this finding was determined to be a Severity Level IV noncited violation. This finding has no crosscutting aspect as it was associated with a traditional enforcement violation.

Inspection Report# : [2011006](#) (*pdf*)

Significance:  Mar 18, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Design the Emergency Diesel Generator Ground Fault Protection Circuitry

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions." Specifically, when designing the bypass circuitry for the emergency diesel generator ground fault trip function, the licensee failed to ensure that the associated electrical components were adequately designed for the continuous duty they would have to withstand under bypassed trip conditions. This could result in an ignition source and subsequent fire in the area under these conditions. This finding was entered into the licensee's corrective action program as Condition Report 201102064.

The team determined that the failure to analyze the suitability of the emergency diesel generator components when

protection features were bypassed was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate design of these components could have prevented continued operation of the emergency diesel generator under ground fault conditions with the trip signal bypassed. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the issue was determined to have very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. Specifically, the licensee revised the associated procedures to include these components in the combustible material exclusion zone. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance. Inspection Report# : [2011006](#) (*pdf*)

Significance:  Mar 18, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Residual Heat Removal Flow Alarm Setpoint

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions." Specifically, as of March 3, 2011, the Mode 6 residual heat removal system low flow alarm setpoint did not adequately account for flow measurement uncertainties, and consequently was non-conservative. The licensee has entered the violation into their corrective action program as Condition Report 201101750.

The team determined that the failure to adequately analyze the uncertainty in measurement of residual heat removal system flow, and the impact of this failure, was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design basis analysis, and plant instrumentation, did not ensure that, while operating in Mode 6, the control room operators would be alerted whenever the residual heat removal system flow through the reactor coolant system was below the required value of 1000 gallons per minute. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," the issue was determined to have very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2011006](#) (*pdf*)

Significance:  Feb 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedure in the Establishment of a Turbine Driven Auxiliary Feedwater Pump Postmaintenance Test Procedure

The inspectors identified a noncited violation of Technical Specification 5.4.1.a involving a failure to follow procedures in the development of Procedure OTS-FC-0006, "TDAFW Pump Post-Maintenance Test Run on Aux Steam." Specifically, the licensee failed to incorporate turbine-driven auxiliary feedwater pump vendor manual precautions, limitations, and technical information in Procedure OTS-FC-0006, which resulted in the axial unloading, rolling element ball skidding, and subsequent degradation to the turbine-driven auxiliary feedwater pump inner outboard thrust bearing. Following discovery during planned maintenance and as immediate corrective actions, the licensee declared the turbine-driven auxiliary feedwater pump inoperable, entered the applicable Technical Specification Limiting Condition for Operation, replaced the

oil and bearings, restored the pump to operability, and initiated Callaway Action Request 201101042 to perform a root cause analysis.

This finding is more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was evaluated using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and was determined to be of very low safety significance (Green) because there was not a design or qualification deficiency that resulted in a loss of operability or functionality, it did not create a loss of system safety function of a single train for greater than the technical specification allowed outage time, it did not represent an actual loss of risk significant equipment, and it did not affect seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of human performance associated with the work practices component because the licensee failed to ensure procedural adherence in the establishment of the turbine-driven auxiliary feedwater pump postmaintenance test procedure.

Inspection Report# : [2011007](#) (pdf)

Significance:  Feb 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedure for Turbine-Driven Auxiliary Feedwater Pump Postmaintenance Testing

The inspectors identified a noncited violation of Technical Specification 5.4.1.a involving five examples of failure to follow
2 Enclosure

Procedure OTS-FC-0006, "TDAFW Pump Post-Maintenance Test Run on Aux Steam." Specifically, operators failed to follow an existing total flow precaution in Procedure OTS-FC-0006 which resulted in the axial unloading, rolling element ball skidding, and subsequent degradation to the turbine-driven auxiliary feedwater pump inner outboard thrust bearing. Following initial condition discovery during planned maintenance and as immediate corrective actions, the licensee declared the turbine-driven auxiliary feedwater pump inoperable, entered the applicable Technical Specification Limiting Condition for Operation, replaced the oil and bearings, restored the pump to operability, and initiated Callaway Action Request 201101042 to perform a root cause analysis.

These findings were more than minor because they affected the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was evaluated Using Manual Chapter 0609.04, "Phase 1 -Initial Screening and Characterization of Findings." These findings were determined to be of very low safety significance (Green) because there was not a design or qualification deficiency that resulted in a loss of operability or functionality, they did not create a loss of system safety function of a single train for greater than the technical specification allowed outage time, they did not represent an actual loss of risk significant equipment, and they did not affect seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of human performance associated with the work practices component because the licensee failed to ensure procedural adherence in the implementation of the turbine-driven auxiliary feedwater pump postmaintenance test procedure.

Inspection Report# : [2011007](#) (pdf)

Significance:  Feb 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedure Results in Inadequate Past Operability Determination

The inspectors identified a non cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," regarding the licensee's failure to follow the requirements of Procedure APA-ZZ-00500, Appendix 3, "Past Operability and Reportability Evaluations." Specifically, the inspectors identified that the past operability evaluation for the turbine-driven auxiliary feedwater pump used a nonconservative calculation of mission time that did not take into account all design and licensing basis functions when determining the mission time. The licensee entered this issue into their corrective action program as Callaway Action Request 201102431 and updated its mission time analysis to account for the turbine-driven auxiliary feedwater pump's specified safety function to bring the plant to a safe shutdown condition.

This finding is greater than minor because if left uncorrected, it would have the potential to lead to a more Significant safety concern because systems that may be inoperable may not be recognized and that it impacted the Mitigating Systems Cornerstone attribute of human performance in that the failure to accurately understand the auxiliary feedwater system mission time affected the mitigating systems objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 -Initial Screening and Characterization of Findings," the finding is determined to have very low safety significance because it did not result in the loss of safety function of any technical specification required equipment. The cause of this finding is related to the problem identification and resolution cross-cutting component of corrective action program because licensee personnel failed to thoroughly evaluate conditions adverse to quality and perform adequate operability determinations.

Inspection Report# : [2011007](#) (pdf)

Significance:  Feb 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Calculate and Implement Conservative Safety Related Equipment Oil Leakage Operability Criteria

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for a failure to adequately determine safety related equipment oil leakage acceptance criteria that was used in operator logs. Specifically, the 2008 licensee fluid leak management program calculations to determine the mission time assessments related to oil leak rates of safety related pumps and motors were nonconservative when added to Procedure ODP-ZZ-0016E, Appendix 1, "Equipment Operator General Inspection Guide." The licensee evaluated this issue in Callaway Action Request 201102431 and calculated new conservative oil leak rates for the affected equipment.

This finding is more than minor because if left uncorrected it has the potential to lead to a more significant safety concern. Specifically, the failure to adequately evaluate and determine an appropriate lube oil leak rate to maintain safety related equipment operability affects the equipment performance attribute of the Mitigating Systems Cornerstone and could have impacted the availability of mitigating equipment if left uncorrected. The finding was evaluated using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined to be of very low safety significance since the as-found condition of the safety related equipment reviewed back to August 15, 2007, found no oil leakage rates that would have caused a loss of system safety function. This finding was not reflective of current licensee performance and therefore, has no cross-cutting aspect.

Significance:  Feb 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Establish Preventative Maintenance Schedule to Protect Safety-Related Equipment from Undetected Degraded Conditions

The inspectors identified a noncited violation of Technical Specification 5.4.1 for a failure to adequately establish and implement procedures required by Regulatory Guide 1.33, Appendix A, Section 9, "Procedures for Performing Maintenance." Specifically, the preventative maintenance schedule to perform periodic lube oil analysis established an 18 month frequency without adequate justification resulting in a failure to promptly detect bearing degradation in the turbine-driven auxiliary feedwater pump. The licensee evaluated this issue in Callaway Action Request 201101042 and has corrective actions to review the lube oil analysis frequency and reduce it to at least a 9 month frequency,-,-. _____ -

This finding is more than minor because if left uncorrected it has the potential to lead to a more significant safety concern. Specifically, the failure to adequately evaluate and determine an appropriate lube oil monitoring schedule resulted in the failure to promptly detect a degraded bearing in the turbine-driven auxiliary feedwater pump affecting the equipment performance attribute of the Mitigating Systems Cornerstone and could have impacted the availability of mitigating equipment if left uncorrected. The finding was evaluated using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined to be of very low safety significance since the as-found condition of the degraded bearing would not have caused a loss of system safety function. The finding has a cross-cutting aspect in the area of human performance associated with the decision making component, in that, the licensee failed to use conservative assumptions in the decision to extend the turbine-driven auxiliary feedwater pump lube oil monitoring interval to 18 months.

Inspection Report# : [2011007](#) (pdf)

Significance:  Feb 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Extent of Cause Results in Missed Safety-Related Pump Overhaul

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix 8, Criterion XVI, "Corrective Action," associated with the licensee's failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee reduced the scope of preventative maintenance for the turbine-driven auxiliary feedwater pump overhaul during Refueling Outage 16 without proper justification, resulting in the failure to perform required pump maintenance. This issue was entered into the licensee's corrective action program as Callaway Action Request 201102407 and the pump has been scheduled to be overhauled during the next refueling outage.

This finding is more than minor because, if left uncorrected, corrective action deficiencies would have the potential to lead to a more significant safety concern. The failure to perform required maintenance could allow equipment degradation affecting the equipment performance attribute of the Mitigating Systems Cornerstone and could have impacted the availability of mitigating equipment if left uncorrected. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because the degraded condition did not result in a loss of operability or functionality. The inspectors determined that the finding has a

cross-cutting aspect in the area of human performance associated with the work control component because the licensee does not appropriately coordinate work activities by incorporating actions to address the impact of changes to work scope on the plant such that nuclear safety is supported.

Inspection Report# : [2011007](#) (pdf)

Significance: G Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Operability Determination Procedure

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

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

Inspection Report# : [2010005](#) (pdf)

Significance: G Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate, Untimely Corrective Actions for a Containment Spray System Condition Adverse to Quality

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

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

Inspection Report# : [2010005](#) (pdf)

Significance:  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Enter Condition Adverse to Quality Associated with Emergency Diesel Generator Jacket Water Keep Warm Pump into the Corrective Action Program

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

This finding is greater than minor because if left uncorrected, the failure to fully utilize the corrective action program could become a more significant safety concern. The inspectors determined that this finding impacted the mitigating systems cornerstone. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as having very low safety significance because it was not a design or qualification deficiency that resulted in a loss of operability or functionality, did not create a loss of system safety function of a single train for greater than the technical specification allowed outage times, and did not affect seismic, flooding, or severe weather initiating events. The cause of this finding is related to the problem identification and resolution crosscutting component of the corrective action program because licensee personnel failed to implement a corrective action program with a low threshold for identifying issues.

Inspection Report# : [2010005](#) (*pdf*)

Significance:  Nov 05, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct Degraded Conditions in Essential Service Water System in a Timely Manner

The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to correct in a timely manner degraded conditions affecting the essential service water system. Specifically, the licensee failed to resolve the combined effects of corrosion and waterhammer events resulting in system leaks. The licensee has experienced the waterhammer events since initial plant startup and has been experiencing problems with corrosion since the mid 1990s. As corrective actions for this issue, the licensee plans to implement two system modifications next refueling outage to mitigate the impacts of waterhammer events. This noncited violation was entered into the corrective action program as Callaway Action Request 201010635.

The issue was more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue is determined to have very low safety significance because the finding is not a design or qualification issue confirmed not to result in 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 nontechnical specification equipment; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the cause of the finding has a crosscutting aspect in the area of human performance associated with the component of resources because the licensee did not maintain the plant to minimize long-standing equipment issues.

Inspection Report# : [2010006](#) (*pdf*)

Significance:  Nov 05, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct Repetitive Failures in Steam Generator Atmospheric Dump Valves in a Timely Manner

The team identified a green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, involving the failure to promptly correct deficiencies affecting the steam generator atmospheric steam dump valves. In 2002, system engineers identified that the valves' current-to-pressure transducers were experiencing degradation because they were subjected to high vibration, and a proposed modification to move the transducers to a low vibration area occurred in 2006. The licensee experienced several additional failures in 2009 and determined that the reliable life of the transducers was 18 months in the high vibration areas. As of the date of the inspection, only one transducer of the four had been moved to a low vibration location, and the team determined that corrective actions for this condition adverse to quality have not been timely. The licensee plans to implement modifications to relocate the remaining three transducers to a lower vibration environment in 2011. The issue was entered into the licensee's corrective action program as Callaway Action Request 200910153.

This issue was determined to be greater than minor because it impacted the Mitigating Systems Cornerstone attribute of human performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors found that even though the steam generator atmospheric steam dump valves were not able to meet their technical specification surveillance requirements of achieving the full open position the valves would open sufficiently to meet its intended safety function. Therefore, the issue was of very low safety significance since it was a design or qualification deficiency confirmed not to result in a loss of functionality. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee failed to maintain long term plant safety by minimization of long-standing equipment issues associated with steam generator atmospheric steam dump valve current-to-pressure transducers. Inspection Report# : [2010006](#) (*pdf*)

Significance: G Nov 05, 2010

Identified By: NRC

Item Type: FIN Finding

Failure to Follow the Corrective Action Program Procedure

The team identified a finding involving the licensee's failure to follow the corrective action program procedure for assigning significance levels to Callaway action requests. This deficiency resulted in the licensee's failure to adequately evaluate the cause and extent of condition for a number of issues, and in some examples resulted in recurrences of the issues. In one example the licensee identified a jacket water leak on Emergency Diesel Generator B in 2008. This significant condition adverse to quality was assigned a Significance Level 3 which only required a lower tier cause evaluation, when the procedure identified a significant condition adverse to quality as an example of a Significance Level 1. The team identified additional examples involving degraded safety-related equipment and security-related issues. As corrective action, the licensee entered the issue into its corrective action program as Callaway Action Request 201010472.

This issue was determined to be greater than minor because if left uncorrected, the issue could become a more significant safety concern. The inspectors determined that the issue involving Callaway Action Request 200812985, the failure of emergency diesel generator train B due to a leak in the jacket water system, was of very low safety significance because it was bounded by the significance of NCV 05000483/2009007-01, "Failure to Ensure Suitable Replacement Parts Essential for Emergency Diesel Generator Train B."

The team evaluated the issue involving Callaway Action Request 200810379, the failure of engineered safety feature power supply SA036E, using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." This issue screened as very low safety significance because it was not a design or qualification deficiency that resulted in a loss of operability or functionality, did not create a loss of system safety function of a single train for greater than the technical specification allowed outage time and did not affect seismic, flooding, or severe weather initiating events.

The team also evaluated several security-related examples of this finding that are described in Enclosure 2 of this letter. These security issues were also determined to be of very low security significance. Based on the sensitivity of security issues, Enclosure 2 is not publicly available because it contains security-related information.

This finding has a crosscutting aspect in the area of human performance associated with the component of training because training was needed for the screening committee to better understand a significant condition adverse to quality and to better understand the significance of security issues.

Inspection Report# : [2010006](#) (*pdf*)

Barrier Integrity

Significance:  Jun 23, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Establish Test Program for Isolation Valves in Post-LOCA Recirculation Flowpath

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XI, “Test Control,” for failure to adequately demonstrate that the seat leakage of centrifugal charging pump and safety injection pump suction isolation valves remained within acceptable limits. These valves have a combined allowable leakage rate of three gallons per minute to ensure that offsite thyroid and whole body doses remain within regulatory limits. Since the flowpaths have isolation valves for which seat leakage is limited to a specific maximum amount, the inspectors identified that they should be considered Category A valves as specified in ASME OM Code which requires the valves be tested at least once every two years. At the end of the inspection period, the licensee was planning a recurring surveillance test to verify seat leakage for these valves is within acceptable limits. This issue was entered into the licensee’s corrective action program as Callaway Action Request 201104577.

This finding was greater than minor because it was associated with the Barrier Integrity Cornerstone attribute of configuration control and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” the issue was determined to represent an actual open pathway in the physical integrity of reactor containment. Using Manual Chapter 0609, Appendix H, “Containment Integrity Significance Determination Process,” this finding was determined to be a Type B finding since it was related to a degraded condition that has potentially important implications for the integrity of containment, without affecting the likelihood of core damage. This finding was found to be of very low safety significance since the nontested flowpath would be comparable to small lines (less than 1 2 inches in diameter) and would not generally contribute to large early release frequency. This finding did not have a cross-cutting aspect since the error associated with the inservice testing program was not reflective of current licensee performance.

Inspection Report# : [2011003](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Significance:  May 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Verify Recipient's License Conditions Prior to shipping Special Nuclear Material

The inspectors identified a noncited violation of 10 CFR 70.42 (c) for failure to verify that a recipient of special nuclear material was authorized to receive the quantity of material shipped. This finding was determined to be of very low safety significance. Specifically, On June 15, 2010, the licensee shipped laundry contaminated with radioactive material to a state licensed processing facility in Alabama. The licensee verified that the processing facility was licensed to handle the material being shipped, but failed to verify that the recipient's license authorized the quantity of material shipped. The licensee notified the Alabama licensee and proposed a revision to the shipping procedures. This violation was entered into the licensee's corrective action program as Callaway Action Request 201104385.

This finding was greater than minor because it was associated with the Public Radiation Safety Cornerstone attribute of program and process (transportation program), and affected the cornerstone objective, in that, license conditions were violated and these conditions are in place, in part, to control exposure to radiation. Using the public radiation safety significance determination process, the inspectors determined the finding had very low safety significance because (1) radiation limits were not exceeded, (2) there was no breach of a package during transit, (3) it did not involve a certificate of compliance issue, (4) it was not a low level burial ground nonconformance, and (5) it did not involve a failure to make notifications or provide emergency information. This finding had a crosscutting aspect in the area of human performance, resources component, because licensee procedures were inadequate to ensure proper shipping of radioactive material and that license conditions were not violated.

Inspection Report# : [2011003](#) (*pdf*)

Significance: SL-IV May 27, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Periodically Update the Final Safety Analysis Report

The inspectors identified a noncited violation of 10 CFR 50.71 "Maintenance of Records," because the licensee failed to update their Final Safety Analysis Report with submittals that include the effects of a change made to the facility. Specifically, the licensee built the old steam generator storage facility on the owner controlled area for long-term radwaste storage of four decommissioned steam generators and failed to update the Final Safety Analysis Report to include these changes to the facility. This issue was entered in the licensee's corrective action program as Callaway Action Request 201104434.

This issue was dispositioned using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. The finding is more than minor because it has a material impact on licensed activities in that the four decommissioned steam generators, with a significant radioactive source term, have been relocated from the plant radiological controlled area to the owner controlled area. In addition, the radwaste management program has been affected because the licensee determined that this low-level radwaste facility will store these large components until an appropriate facility for disposal can be determined. The finding is characterized as a Severity Level IV noncited violation in accordance with NRC Enforcement Policy, Section 6.1, and was treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy.

Inspection Report# : [2011003](#) (*pdf*)

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Significance: N/A Nov 05, 2010

Identified By: NRC

Item Type: FIN Finding

Problem Identification and Resolution

The team concluded that the corrective action program at the Callaway Plant was performing in a satisfactory manner to ensure safe plant operations. However, the team identified a number of instances in which the licensee did not follow its procedural guidance for assigning significance levels to problems identified and, as a result, did not adequately evaluate the causes and/or extent of conditions resulting in several repetitive issues.

The inspectors determined that the licensee evaluated industry operating experience for relevance to the facility and entered applicable items in the corrective action program. The inspectors noted that operating experience was considered in cause evaluations.

The team determined that the licensee had a healthy safety-conscious work environment in that workers felt free to raise safety concerns without fear of retaliation using all avenues available.

Inspection Report# : [2010006](#) (*pdf*)

Last modified : January 04, 2012