

# Callaway

## 4Q/2011 Plant Inspection Findings

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### Initiating Events

**Significance:**  Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Ensure Separation of Stainless Steel and Carbon Steel Hand Files and Wire Brushes**

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion V, for the failure to have procedures that ensured that hand files and wire brushes designated for stainless steel weld preparation were stored separately from hand files and wire brushes used on carbon steel. The licensee took corrective actions to remove the stainless steel designations from stainless steel tools that were mixed with tools used on carbon steel, established segregated locations in tool rooms for the separation of abrasive tools, and trained tool room attendants to properly store and mark abrasive tools designated for use on stainless steel. This issue was entered into the licensee's corrective action program as Callaway Action Request 201108921.

Inspectors determined that the failure to assure that hand files and wire brushes designated for exclusive use on stainless steel were stored separately from tools used on other materials was a performance deficiency. This finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and, if left uncorrected, could become a more significant safety concern. Inspectors performed a Phase 1 screening in accordance with Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance because the issue would not result in exceeding the technical specification limit for identified reactor coolant system leakage or affect other mitigating systems resulting in a total loss of their safety function. This finding has a cross-cutting aspect in the area of problem identification and resolution, associated with the corrective action program, because the licensee did not thoroughly evaluate problems such that the resolutions addressed causes and extent of conditions, as necessary. Specifically, the licensee's response to Callaway Action Request 201107806 identified contaminated tools as the cause of rusting on the motor-driven auxiliary feed pump room cooler stainless steel piping, but the licensee took no further action to identify the cause of the contamination.

Inspection Report# : [2011005](#) (*pdf*)

**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)

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## Mitigating Systems

**Significance:**  Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Maintain Simulator Fidelity**

The inspectors identified a non-cited violation of 10 CFR Part 55.46(c), "Plant-Referenced Simulators," for failure of the licensee to ensure that the plant-referenced simulator demonstrated expected plant response to transient and accident conditions to which the simulator has been designed to respond. Specifically, the licensee failed to ensure simulator modeling of power-operated relief valve and pressurizer safety valve operation was consistent with the actual plant, introducing the potential for negative operator training. Due to errors made in modeling updates after steam generator replacement in 2005, each pressurizer safety valve was sized in the simulator to allow approximately 3.3 times higher than the design flow rate in the actual plant, and each power operated relief valve was sized to allow approximately 3.5 times higher than the design flow rate capacity provided in the actual plant. The licensee documented their corrective actions for this issue in Callaway Action Request 201101255.

The failure of the licensee's simulator staff to ensure that the plant-referenced simulator demonstrated expected plant response to transient and accident conditions for which the simulator has been designed to respond was a performance deficiency. The performance deficiency is more than minor because it adversely impacted the human performance attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, the performance deficiency could have become more significant in that training on related accident scenarios could have a negative impact on how licensed operators would respond to an actual event in the control room. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green) because there was no actual event at the plant similar to the simulator scenario where inappropriate actions were taken in the control room based on training with incorrectly sized components in the simulator. This finding has no cross-cutting aspect assigned because the cause was not representative of current licensee performance.

Inspection Report# : [2011005](#) (pdf)

**Significance:**  Dec 31, 2011

Identified By: NRC

Item Type: FIN Finding

### **Failure to Conduct Simulator Testing in Accordance with ANSI/ANS 3.5-1998**

The inspectors identified a finding associated with the conduct of simulator performance testing because the licensee was not testing in accordance with the standards of ANSI/ANS 3.5-1998. Specifically, the licensee did not include relief valve flow in their 2010 test of transient (10) of ANSI/ANS 3.5-1998, Appendix B, Section B3.2.1, "Slow Primary System Depressurization to Saturated Condition with Pressurizer Relief or Safety Valve Stuck Open." The licensee initiated corrective action documented in Callaway Action Request 201107912.

Conducting simulator performance testing that was not in accordance with the ANSI/ANS 3.5-1998 standard was a performance deficiency. The performance deficiency is more than minor because it adversely impacted the human performance attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, the performance deficiency could have become more significant in that not completing the required simulator testing annually can lead to not detecting and correcting errors in the simulator so that it models the actual plant correctly. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, and the

corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (green) because there was no actual event caused by not modeling the actual plant correctly. This finding has no cross-cutting aspect assigned because the cause was not representative of current licensee performance.

Inspection Report# : [2011005](#) (pdf)

**Significance:** G Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Adequately Assess and Manage Outage Risk Associated with Significant Switchyard Work**

The inspectors identified a non-cited violation of 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," involving the licensee's failure to assess and manage outage risk related to significant switchyard work. Specifically, the licensee allowed risk significant relay test work to result in loss of one of two offsite safety related 4 kV power feeds to the plant during Refueling Outage 18. With Callaway Plant in Mode 6, "Refueling," the risk assessment for October 21, 2011, and the Outage Shutdown Management Plan prohibited significant switchyard work. However, at 1:21 p.m., emergency diesel generator A bus NB01 became deenergized due to improper switchyard testing. Callaway Action Request 201108888 was initiated to develop corrective actions.

Failure to properly assess and manage the risk of significant switchyard work during a high decay heat condition was a performance deficiency. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The offsite power system was affected by this event. Using Manual Chapter 0609, Appendix G, Attachment 1, Checklist 4 – "PWR Refueling Operation: RCS level > 23' OR PWR Shutdown Operation with Time to Boil > 2 hours And Inventory in the Pressurizer," this finding was determined to be of very low safety significance because it did not increase the likelihood of a loss of reactor coolant system inventory, did not degrade the ability to terminate a leak path or add reactor coolant system inventory when needed, and did not degrade

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the ability to recover decay heat removal, if lost. This finding has a cross-cutting aspect in the area of human performance associated with the resources component because Procedure EDP-ZZ-01129, "Callaway Plant Risk Assessment," Attachment 6, Step 6.c, was not sufficiently complete and accurate to define significant switchyard work.

Inspection Report# : [2011005](#) (pdf)

**Significance:** G Dec 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Improper Ground and Test Device Damages Residual Heat Removal Pump Switchgear**

The inspectors reviewed a Green self-revealing non-cited violation of 10 CFR Part 50 Appendix B, Criterion V, "Procedures," involving the licensee's failure to correctly install a ground test device for the train A safety-related 4160 volt switchgear, NB01. During maintenance on the train A safety related bus, workers improperly placed a ground test device with 2000 ampere stab adapters into the 1200 ampere breaker cubicle (for the residual heat removal pump). This damaged the switchgear connection point and caused the breaker to fail, rendering the pump inoperable. The reactor was defueled so the residual heat removal system was not required by technical specifications at the time, but the bus was required to be removed from service for repairs. The licensee repaired the bus connection point, and the pump was retested satisfactorily. This finding was entered into the licensee's corrective action program as Callaway Action Request 201109122.

Failure to install the correctly configured ground and test device into the NB0101 cubicle of the NB01 switchgear was a performance deficiency. This is more than minor because it is associated with the human 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.

Specifically, improper maintenance caused the residual heat removal pump to become unavailable. Because no fuel was in the vessel at the time of the event, the inspectors referred the issue to a Region IV senior reactor analyst for the significance determination. The analyst used NRC Inspection Manual 0609, Appendix G, "Shutdown Operations

Significance Determination Process,” to evaluate the significance of the finding. Since all of the fuel had been removed from the vessel there was no potential for core damage (the delta core damage frequency was zero). Therefore, the finding is of very low safety significance (Green). The finding has a cross-cutting aspect in the area of human performance associated with the resources component in that the licensee failed to ensure training of maintenance personnel was adequate to assure nuclear safety.  
Inspection Report# : [2011005](#) (pdf)

**Significance:** G Dec 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to Isolate Control Room Air Conditioning Unit SGK04A for Maintenance**

The inspectors reviewed a Green self-revealing non-cited violation of Technical Specification 5.4.1.a, “Procedures,” involving the failure to isolate an electrical power supply during maintenance on control room air conditioning system train A. Specifically, while removing an electrical cabinet for maintenance, workers discovered an energized lead that was supposed to have been isolated for the work. Workers failed to stop work and make appropriate notifications. As a result, when the lead was reterminated, it grounded the bus and caused inverter NN11 to shift to an alternate power supply. This caused operators to make an unplanned entry into a 24-hour shutdown technical specification action statement. The licensee restored normal power to inverter NN11 within 4 hours. This issue was entered into the corrective action program as Callaway Action Request 201107612.

Failure to stop work when a lockout tagout isolation was discovered to be inadequate was a performance deficiency. This finding is more than minor because it is associated with the configuration control 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. Specifically, inverter NN11 was rendered less reliable by the improper maintenance. 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 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 practices component because licensee personnel failed to stop in the face of uncertainty or unexpected circumstances.

Inspection Report# : [2011005](#) (pdf)

**Significance:** G Dec 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to Correctly Implement Plant Maintenance Procedures**

The inspectors reviewed a self-revealing non-cited violation of Technical Specification 5.4.1.a, “Procedures,” involving the failure to ensure compliance with relay test maintenance procedures associated with electrical switchyard work that affected the performance of safety related equipment. On October 21, 2011, Callaway Plant was in Mode 6 with switchyard activities in progress to test transfer trip and lockout relay devices. At 1:21 p.m. the control room operators received several annunciators indicating that diesel generator bus A and its safety related loads had become deenergized. An improperly operated lockout relay had cascaded a test signal onto other components in the plant electrical system. This issue was entered into the corrective action program as Callaway Action Request 201108691.

Failure to establish the safe working conditions per the transfer trip procedure and failure to operate the lockout relay in the manner specified by the lockout relay procedure were performance deficiencies. 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. Specifically, one of the two offsite power feeds to the plant was lost. Using Manual Chapter 0609 Appendix G Attachment 1, Checklist 4 – “PWR Refueling Operation: RCS level > 23’ OR PWR Shutdown Operation with Time to Boil > 2 hours And Inventory in the Pressurizer,” this finding was determined to be of very low safety significance because it did not increase the likelihood of a loss of reactor coolant system inventory, did not degrade the ability to terminate a leak path or add reactor coolant system inventory when needed, and did not degrade the ability to recover decay heat removal. This finding has a cross-cutting

aspect in the area of human performance associated with the work controls component because the electrical relay test technicians, onsite engineering, and work control staff failed to adequately maintain interfaces to communicate and safely coordinate significant switchyard activities to ensure proper human performance.

Inspection Report# : [2011005](#) (pdf)

**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 -----eh-a-ra-cterizationofFfhalngs," 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.

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

**G**

**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:** **G** 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)

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## **Barrier Integrity**

**Significance:** **G** 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*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## 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*)

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## 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.

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## Miscellaneous

Last modified : March 02, 2012