

Callaway

1Q/2014 Plant Inspection Findings

Initiating Events

Significance: G Mar 28, 2014

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Correct a Design Deficiency in Main Generator Bus Duct Cooling System

The inspectors reviewed a self-revealing finding involving the failure to correct a design deficiency known to represent a single point plant trip vulnerability. Specifically, Procedure EDP-ZZ-01131, "Callaway Plant Health Program," required documenting and correcting Health Issues, which included single point vulnerabilities. Health Issue 2005028 was written to identify that dampers in the main generator bus duct cooling system were not designed for the flow rate they experienced. This document was subsequently closed without correcting the single point vulnerability it was written to address. Also, in 2011, after Callaway Action Request 201108672 identified that this concern still existed, the licensee failed to document the condition as a new Health Issue or correct the condition. As a result, the damper blades came loose and entered the bus duct, which resulted in a fault on the auxiliary transformer and a subsequent unit trip in July 2013. As a result of the trip, the site performed a modification to remove the single point vulnerability and documented the issue in their corrective action program as Callaway Action Request 201305943.

The inspectors determined that failure to correct a design deficiency known to represent a single point plant trip vulnerability was a performance deficiency. This performance deficiency was more than minor because it is associated with the design control attribute of the Initiating Events Cornerstone and affects the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to correct a long term design issue resulted in an electrical fault and subsequent reactor trip. The inspectors assessed the finding in accordance with NRC Inspection Manual 0609, Appendix A, Exhibit 1, "Initiating Event Screening Questions," and determined the finding required a detailed risk evaluation because the performance deficiency caused an initiating event and affected some mitigating equipment. Therefore, a senior reactor analyst performed a detailed risk evaluation. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was approximately $4.2E-7$ /year. The dominant core damage sequences involved transients that led to anticipated transient without scram events. The recovery of the startup transformer, the recovery of the circulating water pumps, and the availability of the auxiliary feedwater system helped minimize the risk significance. This finding has a cross-cutting aspect in the consistent process component of the human performance cross-cutting area because the licensee failed to use a consistent, systematic approach to make decisions and risk insights were not incorporated as appropriate. Specifically, despite identifying a single point vulnerability that could have caused a plant trip in 2011, the licensee's processes were not properly utilized to address the issue and risk insights were not used properly to elevate the importance of the issue to ensure the licensee took appropriate action.

Inspection Report# : [2014002](#) (pdf)

Significance: G Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Appropriately Pre-plan and Perform Maintenance on the Unit Auxiliary Transformer

The inspectors reviewed a self-revealing non-cited violation of Technical Specifications 5.4.1 and Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," involving the failure to appropriately pre-plan and perform maintenance on equipment that can affect the performance of safety-related equipment. Specifically, the licensee failed to properly pre-plan and perform maintenance on the unit auxiliary transformer that contributed to a fire. During Refueling Outage 19, the unit auxiliary transformer was providing power to non-safety house loads and train B battery chargers when it experienced a phase to phase short and fire in the surge capacitor. The fire and loss of power affected the performance of safety-related batteries and battery chargers, and led to manual actuations of the reactor protection system. This issue was entered into the licensee's corrective action program as Callaway Action Request 201302877. Corrective actions included installing new surge protectors on the unit auxiliary transformer, revising station procedures for connecting and disconnecting the surge protectors, and ordering new surge capacitors for the startup transformer.

The failure to appropriately pre-plan and perform maintenance on equipment that can affect the performance of safety-related equipment was a performance deficiency. The performance deficiency was more than minor because it adversely affected the protection against external factors attribute of the Initiating Events Cornerstone, and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the fault and fire led to a loss of power to mitigating systems while the reactor was shutdown. Using Inspection 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," the finding was determined to be of very low safety significance (Green) because the licensee maintained adequate event mitigation capabilities, the event did not result in a change in reactor coolant system inventory or temperature, and it did not require a quantitative risk assessment. This finding has a cross-cutting aspect in the human performance area associated with the resources component because the licensee failed to ensure that the equipment and maintenance procedures were adequate to assure nuclear safety.

Inspection Report# : [2013003](#) (*pdf*)

Significance: G Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Appropriately Pre-plan and Perform Maintenance on Safeguards Transformer B

The inspectors reviewed a self-revealing non-cited violation of Technical Specification 5.4.1 and Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," involving the failure to appropriately pre-plan and perform maintenance on equipment that can affect the performance of safety-related equipment. Specifically, the licensee directed contractors to perform work on safeguards transformer B with work instructions, training, and supervisory oversight that was not appropriate for the individuals performing the work. This issue was entered into the licensee's corrective action program as Callaway Action Request 201302280. Corrective actions included a revision to the work instructions to be more specific on grounding locations and a refocus and retraining of grounding electrical systems. Planned corrective actions include establishing a process for identifying high risk outage activities similar to the process used for online maintenance.

The failure to appropriately pre-plan and perform maintenance on equipment that can affect the performance of safety-related equipment was a performance deficiency. This performance deficiency was more than minor because it adversely affected the procedure quality attribute of the Initiating Events Cornerstone, and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," the finding was determined to be of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding has a cross-cutting aspect in the human performance area associated with the work practices component because the primary cause for the performance deficiency was that the licensee failed to ensure supervisory and management oversight of work activities, including contractors, such that nuclear

safety is supported.

Inspection Report# : [2013003](#) (pdf)

Mitigating Systems

Significance: G Mar 28, 2014

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Scaffold Procedure to Ensure Nearby Equipment is Not Impacted

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to provide an adequate procedure for construction and disassembly of scaffolding. Specifically, the licensee failed to ensure that nearby systems, structures, and components were not impacted during periods while scaffolding was being constructed and disassembled in their vicinity. The licensee documented this concern in Callaway Action Request 201400646 and immediately suspended any scaffold work until the procedure could be revised to ensure operability of adjacent equipment during construction and disassembly.

Failure to ensure that nearby systems, structures, and components were not impacted during periods when scaffolding is being constructed or disassembled in their vicinity was a performance deficiency. This performance deficiency affected the Mitigating Systems Cornerstone and was more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern because future scaffolds could impact the functionality of mitigating systems. The finding was determined to be of very low safety significance since the finding did not result in identifying any specific example of a loss of functionality of mitigating systems, structures, and components. This finding does not have a cross-cutting aspect because it did not represent current performance, since this procedure had been in effect since 2005.

Inspection Report# : [2014002](#) (pdf)

Significance: G Mar 28, 2014

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Implement Corrective Actions to Preclude Repetition

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Actions,” involving the licensee’s failure to prevent repetition of a significant condition adverse to quality. Specifically, the licensee failed to implement corrective actions to prevent repetition that were identified for a significant condition associated with the uncoupling of an essential service water system valves and their motor operator. The condition had been identified during similar failures in 1990 and 1993, but the planned corrective actions were never implemented. As a result, another service water valve failed in the same manner in 2012. This issue was entered into the licensee’s corrective action program as Callaway Action Request 201401188. Corrective actions included updating the preventative maintenance instructions to include torque checks on the coupling bolts and verify all valves with similar couplings are checked by December 2014.

The inspectors determined the failure to prevent repetition of a significant condition adverse to quality was a performance deficiency. This performance deficiency was more than minor because it adversely 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 inspectors assessed the finding in accordance with NRC Inspection Manual 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” and determined the finding required a detailed risk evaluation

because it involved the failure of a safety related valve (a single train) for longer than the technical specification allowed outage time. Therefore, a senior reactor analyst performed a bounding Phase 3 significance determination. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was approximately 4.5E-8/year. The dominant core damage sequences associated with the failed valve included losses of offsite power, failure of the redundant valve in the same train, random failures of the opposite train pump, failure to recover offsite power in 2 hours, and a consequential reactor coolant pump seal loss of coolant accident. Equipment that helped mitigated the risk included the redundant essential service water isolation valve in the same train as well as the auxiliary feedwater system and the steam generators. This finding did not have a cross-cutting aspect because the issue occurred in 1993 and is not indicative of current plant performance.

Inspection Report# : [2014002](#) (*pdf*)

Significance: G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Ultimate Heat Sink Cooling Tower - Incorrect Action Criteria in Control Room Evacuation Procedure

The inspectors identified a non-cited violation of Technical Specification 5.4.1(d), "Procedures," which states, in part, that written procedures shall be established, implemented, and maintained covering fire protection program implementation. Specifically, prior to October 10, 2013, Procedure OTO ZZ 00001, "Control Room Inaccessibility," Revision 38, steps D31 and D32, directed operators to use incorrect process indication and action criteria to diagnose and prevent icing conditions in the cooling tower after the control room was evacuated. This condition was entered into the corrective action program as Callaway Action Request 201307709. As a result, the licensee revised the action criteria to direct the operators to take action to prevent icing in the cooling tower.

The inspectors determined that the failure of Procedure OTO ZZ 00001 to contain the appropriate criteria for operator action to control the ultimate heat sink cooling tower bypass valve after a control room evacuation was a performance deficiency. The inspectors determined that the performance deficiency was associated with the Mitigating Systems Cornerstone and was more than minor, and therefore a finding, because, if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the action criteria would not direct the operators to correctly diagnose, prevent, or mitigate icing in the ultimate heat sink cooling tower after a control room evacuation. Using NRC Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors determined that the finding had very low safety significance (Green) because this finding would not have prevented the reactor from reaching and maintaining safe shutdown. This finding was not assigned a cross-cutting aspect because the most significant contributor was not reflective of current licensee performance.

Inspection Report# : [2013005](#) (*pdf*)

Significance: G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failue to Correct Non-conservative Safety Related Equipment Oil Leakage Criteria

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for a failure to correct a condition adverse to quality. Specifically, the licensee's calculations to determine acceptable oil leak rates of safety related pumps in response to Callaway Action Requests 201102434 and 201207677 failed to ensure that the pumps' mission times could be met. As a result, non-conservative limits were added to Procedure ODP ZZ 0016E, Appendix 1, "Operations Technician General Inspection Guide." The licensee entered this issue into the corrective action program in Callaway Action Request 201308127. NRC inspectors determined there was never a time within the last several years when any of these pumps exceeded the revised oil leakage limits, once corrected.

The inspectors determined that the failure to correct non-conservative oil leakage specifications used in operator logs is a performance deficiency. The inspectors determined that the performance deficiency was associated with the Mitigating Systems Cornerstone and was more than minor, and therefore a finding, because, if left uncorrected, it

would have the potential to lead to a more significant safety concern. Specifically, the failure to evaluate and determine appropriate lube oil leakage to maintain safety related equipment could have impacted the availability of mitigating systems if left uncorrected. The finding was assessed using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and was determined to be of very low safety significance since the inadequate specifications did not result in a loss of operability for the affected systems. This finding has a cross-cutting aspect in the decision-making component of the human performance cross-cutting area because the licensee failed to utilize a systematic process to ensure safety is maintained, specifically the authority and roles for decisions affecting nuclear safety in the corrective actions for Callaway Action Requests 201102434 and 201207677 were not formally defined resulting in inadequate engineering conclusions being incorporated into operations procedures. Inspection Report# : [2013005](#) (pdf)

Significance:  Sep 27, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Administer a Comprehensive Requalification Operating Test

The inspectors identified a non-cited violation of 10 CFR 55.59, "Requalification," for failure to administer a comprehensive annual requalification operating test to one crew. After a quality review by NRC inspectors, it was determined that the job performance measure set administered in Week 2 of the testing cycle did not contain at least 40 percent alternate path job performance measures, as required by Procedure CTM-OPS, "Callaway Training Manual: Operations Programs," Section 6.5.3.g.1.c. One of the job performance measures which the licensee had credited as an alternate path did not meet the criteria to be considered an alternate path, thereby leaving only one actual alternate path job performance measure in the set (20 percent). As an immediate corrective action, the licensee replaced one of the job performance measures from the Week 2 set with a new alternate path job performance measure which was administered to the affected operators, thereby ensuring that the 40 percent requirement was met prior to the completion of the 2-year requalification cycle. This issue was entered into the licensee's corrective action program as Callaway Action Request 201306740.

Failure to administer a comprehensive annual operating test containing at least 40 percent alternate path job performance measures to one crew is a performance deficiency. This performance deficiency is more than minor, and therefore a finding, 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 finding could have become more significant in that allowing licensed operators to return to the control room without a valid demonstration of appropriate knowledge on the annual operating test could be a precursor to a more significant event if latent knowledge deficiencies went unidentified. Using NRC 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, while it was related to annual operating test quality, less than 40 percent of the reviewed job performance measures and simulator scenarios were flawed (Manual Chapter 0609, Appendix I, Flowchart, Blocks 6, 7, and 8). This finding has a cross-cutting aspect in the area of resources associated with ensuring that work packages (in this case exam packages) are complete, accurate, and up-to-date such that industry standards for exam quality are met. Inspection Report# : [2013004](#) (pdf)

Significance:  Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Monitor and Maintain Emergency Core Cooling System Room Coolers

The inspectors identified a non-cited violation of 10 CFR 50.65, involving the licensee's failure to monitor performance of structures, systems, or components in a manner sufficient to provide reasonable assurance that these

structures, systems, or components are capable of fulfilling their intended functions. Specifically, the licensee failed to adequately monitor the cooling water flow through the safety related room coolers that periodically became blocked by silting, to ensure they maintained their capability to remove the heat from the rooms. This issue was entered into the licensee's corrective action program as Callaway Action Request 201301108. Corrective actions included a requirement to monitor the flow rates monthly and determine the appropriate monitoring and flushing requirements based on the results.

The failure to monitor performance of structures, systems, or components in a manner sufficient to provide reasonable assurance that these structures, systems, or components are capable of fulfilling their intended functions was a performance deficiency. This performance deficiency was more than minor because it adversely 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. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance (Green) because all of the questions received a negative response. This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience component because the licensee failed to systematically collect, evaluate, and communicate relevant internal operating experience about silting of room coolers to internal stakeholders.

Inspection Report# : [2013003](#) (pdf)

Significance: G Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correctly Screen Repetitive Equipment Failures

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the licensee's failure to perform activities affecting quality in accordance with procedures. Specifically, the licensee failed to recognize the significance of repetitive refrigerant leaks on the safety-related Class 1E electrical equipment air conditioning units and assign the appropriate significance level in accordance with APA-ZZ-00500, "Corrective Action Program," Revision 57. This issue was entered into the licensee's corrective action program as Callaway Action Request 201304985. Further corrective actions are being evaluated, including enhancements to Callaway's corrective action procedure for raising significance of repetitive issues and evaluating new enhancements for the corrective action program's screening process.

The failure to perform activities affecting quality in accordance with procedures was a performance deficiency. This performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone objective of ensuring the reliability of systems that respond to initiating events. Specifically, the licensee failed to recognize the significance of repetitive refrigerant leaks on the safety related Class 1E electrical equipment air conditioning units and assign the appropriate significance level during issue screening, and therefore failed to perform a cause analysis and correct the cause. The finding required a detailed risk evaluation because it involved the potential failure of safety related equipment for longer than the technical specification allowed outage time. A senior reactor analyst determined that the change to the core damage frequency was much less than E-7/yr (Green). In each case, the affected chiller, while incapable of meeting the 30-day design basis mission time, could have still functioned properly and supported the inverters during the probabilistic risk assessment 24-hour mission time. Therefore, there was no quantifiable increase in the core damage frequency or the large early release frequency. This finding has a cross-cutting aspect in the area of problem identification and resolution with a problem evaluation component, because the licensee failed to fully evaluate the collective body of data regarding the Class 1E air conditioning units such that the resolutions address the causes and extent of condition, including proper classification. Specifically the licensee failed to thoroughly evaluate the repetitive failures all facets of this issue, including properly classifying the refrigerant leaks.

Inspection Report# : [2013003](#) (pdf)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Significance:  Dec 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Class and Describe a Radioactive Material Shipment Correctly and Failure to Include all Required Hazard Communication Information in a Radioactive Shipment Document

Inspectors reviewed a self-revealing non-cited violation of 10 CFR 71.5(a) because the licensee failed to class and describe a radioactive material shipment correctly and failed to include all required hazard communication information in a radioactive shipment document. The licensee entered this issue into the corrective action program as Callaway Action Request 201204454 and licensee representatives stated procedure guidance will be revised as a corrective action.

Failure to class and describe a radioactive material shipment correctly and to include all required hazard communication information in accordance with federal hazardous material transportation regulations was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Public Radiation Safety Cornerstone attribute of program and process (transportation program) and adversely affected the associated cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation, in that it resulted in the incorrect identification and quantification of radioactive material transported in the public domain. Using Inspection Manual Chapter 0609 Appendix D, "Public Radiation Safety Significance Determination Process," dated February 12, 2008, the inspectors determined this to be of very low safety significance (Green) because the violation did not involve the radioactive effluent release program or the radiological environmental monitoring program, but the violation did involve the transportation of radioactive material. The violation was not (1) in excess of radiation limits, (2) a breach of package during transit, (3) a certificate of compliance issue, (4) a low-level burial ground noncompliance, or (5) a failure to make notifications or provide emergency information. The violation has a human performance cross-cutting aspect associated with licensee resources, in that the licensee had insufficient instruction in its shipping guidance to ensure package contents were verified.

Inspection Report# : [2013005](#) (*pdf*)

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Last modified : May 30, 2014