

Callaway

4Q/2016 Plant Inspection Findings

Initiating Events

Significance:  Jun 30, 2016

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Follow Plant Foreign Material Exclusion Procedure

The inspectors reviewed a self-revealed finding for the licensee's failure to follow the plant procedure for foreign material exclusion. Specifically, after finding foreign material (broken cable ties) within the main generator excitation transformer, established as a foreign material exclusion Level 2 area, the licensee failed to determine the reason for the foreign material and enter the issue into the corrective action program for resolution as required by Procedure APA-ZZ-00801, "Foreign Material Exclusion," Revision 32.

The licensee's failure to follow the plant procedure for foreign material exclusion was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely 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, after identifying several broken cable ties on the floor inside a foreign material exclusion Level 2 area the licensee did not determine the reason for the foreign material nor enter the condition into the corrective action program as required by Procedure APA-ZZ-00801. Because the licensee failed to understand what caused the cable tie degradation, a subsequent cable tie failure resulted in a plant trip. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the finding was determined to be of very low safety significance 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 of training in the human performance area because the organization did not provide training and ensure knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values. Specifically, several groups within the licensee's organization were unaware the excitation transformer cabinet was classified as a foreign material exclusion Level 2 area nor the requirements if foreign material is found within the foreign material exclusion area [H.9].

Inspection Report# : [2016002](#) (*pdf*)

Mitigating Systems

Significance:  Sep 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Maintain Simulator Fidelity

The inspectors identified a non-cited violation of 10 CFR 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 is designed to respond. Specifically, the licensee failed to ensure simulator modeling of the control rod motor generator sets was consistent with the actual plant, introducing the potential for negative

operator training. Due to the licensee not considering 1989 vendor design input on how long the control rod motor generator sets would keep control rod drive mechanisms energized after their input breakers were opened, the simulator was modeled to keep control rods withdrawn approximately two minutes longer (maximum case) than they would have been withdrawn. The licensee documented their corrective actions for this issue in Condition Report 201503621.

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 was designed to respond is a performance deficiency. The performance deficiency is more than minor because it adversely impacts 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. Using NRC Inspection Manual Chapter 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process (SDP)," dated December 6, 2011, the finding was determined to have very low safety significance (Green) because there was no actual event at the plant where inappropriate actions were taken in the control room based on training with incorrectly modeled components in the simulator. This finding has no cross-cutting aspect assigned because the cause was not indicative of current licensee performance.

Inspection Report# : [2016003](#) (*pdf*)

Significance: G Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Account for Water Hammer Stresses in Essential Service Water System Calculations

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to account for the essential service water pipe stresses caused by pressure fluctuations of the known column closure water hammer phenomenon. The licensee failed to properly account for essential service water piping membrane stress and impact loads as required by the 1974 ASME Code, Section III, paragraphs ND-3112.4 and ND-3111. Specifically, the licensee's design calculations for the essential service water system did not account for the pressure fluctuations caused by a known column closure water hammer phenomenon that occurs during a loss of off-site power or load sequencer testing. The licensee completed a prompt operability determination assuring the system was operable under the current conditions and was completing engineering evaluations of the data collected to demonstrate the operability of the system under design conditions. The licensee entered this issued into the corrective action program as Callaway Action Requests 201603472 and 201603819.

The inspectors determined that the licensee's failure to account for the pressure fluctuations caused by a known column closure water hammer phenomenon in the design calculations for the essential service water system was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the associated objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined that this finding was of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality, (2) did not represent a loss of system and/or function, (3) did not represent an actual loss of function of at least a single train for longer than its allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time, and (4) does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significant for greater than 24 hours in accordance with the licensee's maintenance rule program. This finding has a cross-cutting aspect of conservative bias in the human performance area because the licensee failed to demonstrate that a proposed action was safe in order to proceed, rather than unsafe in order to stop. Specifically, when the licensee recognized that the column separation water hammer phenomenon was occurring in the essential service water system, they only applied the forces to the containment coolers, not the entire system [H.14].

Inspection Report# : [2016002](#) (pdf)

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Meet Applicable ASME Code Requirements for Repairs to Components in the Essential Service Water System

The inspectors identified a non-cited violation of 10 CFR 50.55a, “Codes and Standards,” for the licensee’s failure to repair various ASME Code Class 3 components in accordance with ASME Code, Section XI requirements. Specifically, the licensee did not follow the applicable ASME Code requirements when making repairs to various components in the ASME Code Class 3 essential service water system. The licensee reasonably determined the essential service water system remained operable, and completed the necessary repairs and testing to restore compliance with ASME Code. The licensee entered this issue into their corrective action program as Callaway Action Requests 201603640 and 201604282.

The inspectors determined that the programmatic failure to repair various ASME Code Class 3 components in the essential service water system in accordance with ASME Code was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the associated objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, inspectors determined that this finding was of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality, (2) did not represent a loss of system and/or function, (3) did not represent an actual loss of function of at least a single train for longer than its allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time, and (4) does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significant for greater than 24 hours in accordance with the licensee’s maintenance rule program. Specifically, the licensee performed a historical system health review and reasonably determined the essential service water system remained operable because periodic system walkdowns by the system owner and shiftly rounds by operations had not identified significant system leaks, and the appropriate repairs and testing were completed on the affected components. This finding has a cross-cutting aspect of training in the human performance area because the organization did not provide training and ensure knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values. Specifically, the licensee failed to ensure training of the personnel was adequate to recognize that the repair of the leaks constituted repairs in accordance with ASME Code, Section XI and thus failed to include the necessary ASME testing requirements in the work performance packages to ensure adequate performance of an activity which affected testing of a safety-related modification/repair to risk-significant systems, and thereby ensure nuclear safety [H.9].

Inspection Report# : [2016002](#) (pdf)

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Evaluate Operability for a Degraded Condition

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 an adequate operability assessment when a degraded or nonconforming condition was identified. Specifically, after the licensee identified that a severe water hammer transient would occur following a loss of off-site power, the licensee generated an operability evaluation that relied on judgement and inaccurate information which failed to establish a reasonable expectation of operability. Following

questions from inspectors the licensee determined that this judgement was not correct and performed a new evaluation to ensure operability of the essential service water system. The licensee entered this issue into their corrective action program as Callaway Action Request 201605488.

The licensee's failure to properly assess and document the basis for operability when a severe water hammer occurred in the essential service water system was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, severe water hammer transients in the essential service water system due to a loss of off-site power, result in a condition where structures, systems, and components necessary to mitigate the effects of accidents may not have functioned as required. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined that this finding was of very low safety significance (Green) because the finding: did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic event, and (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality, (2) did not represent a loss of system and/or function, (3) did not represent an actual loss of function of at least a single train for longer than its allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time, and (4) does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant for greater than 24 hours in accordance with the licensee's maintenance rule program. This finding has a cross-cutting aspect of conservative bias in the human performance area because the licensee failed to demonstrate that a proposed action was safe in order to proceed, rather than unsafe in order to stop. Specifically, the licensee's use of unsupported judgement and incorrect data resulted in an evaluation that failed to demonstrate a reasonable expectation of operability [H.14].

Inspection Report# : [2016002](#) (*pdf*)

Significance:  Jun 30, 2016

Identified By: NRC

Item Type: VIO Violation

Failure to Promptly Correct Conditions Adverse to Quality

The inspectors identified a cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," associated with the licensee's failure to take timely corrective action for a previously identified condition adverse to quality. Specifically, the licensee failed to adequately resolve water hammer and corrosion issues that were previously identified by the NRC as non-cited violation 05000483/2010006-01 and the failure to resolve these issues resulted in subsequent safety-related equipment failures. The licensee performed an operability determination that established a reasonable expectation of operability pending implementation of corrective actions. The licensee entered this issue into their corrective action program as Callaway Action Request 201604440.

The licensee's failure to take timely and adequate corrective actions to correct a condition adverse to quality was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to correct water hammer and corrosion issue resulted in the licensee declaring safety-related room coolers and chillers inoperable until an analysis of system operability was completed. This affected their capability to respond to initiating events to prevent undesirable consequences Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, inspectors determined that this finding was of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality, (2) did not represent a loss of system and/or function, (3) did not represent an actual loss of function of at least a single train for longer than its allowed outage

time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time, and (4) does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant for greater than 24 hours in accordance with the licensee's maintenance rule program. This finding has a cross-cutting aspect of resources in the human performance area because the licensee did not ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety. Specifically, by failing to address water hammer and corrosion issues, station management failed to ensure that the essential service water system was available and adequately maintained to respond during a loss of off-site power event [H.1].

Inspection Report# : [2016002](#) (*pdf*)

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Operability Evaluation for Degraded Flood Mitigation Capability in Piping Penetration Room

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 an adequate operability determination for safety related components located in the 1988 foot auxiliary building train B piping penetration room (room 1203) based on degraded internal flooding drain capability. Specifically, the immediate operability determination included incorrect assumptions that were not verified to support the operability determination as required by Procedure ODP ZZ 00001, Addendum 15, "Operability and Functionality Determinations," Revision 8. The immediate corrective action was to implement a compensatory measure to support operability of the equipment in room 1203. The issue was placed in the corrective action program as Callaway Action Request 201601412.

The licensee's failure to verify assumptions used in the immediate operability determination and ensure a sound basis for operability exists per plant procedures was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is similar to examples 3.j and 3.k in Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and if left uncorrected, it has the potential to lead to a more significant safety concern. Specifically, failure to perform adequate operability evaluations by verifying assumptions and ensuring a sound basis for operability exists may result in the failure to enter the appropriate limiting conditions of operation for technical specification equipment. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding involved the degradation of equipment specifically designed to mitigate a flooding initiating event, therefore, Exhibit 4, "External Events Screening Questions," was used to complete the screening. The finding was determined to need a detailed risk evaluation because if the equipment (i.e., floor drain lines) is assumed to be completely failed or unavailable, it would degrade one or more trains of a system that supports a risk significant system or function. In consultation with the Senior Reactor Analyst, the finding was determined to be of very low safety significance because, based on the actual condition of the drains and the extent of the clogging in room 1203, an evaluation by the licensee showed that the maximum internal flooding water level in the room would not challenge the operability of any equipment needed for safe shutdown or to mitigate an accident. This finding has a team work cross cutting aspect in the human performance cross cutting area because individuals and work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, inadequate communication between engineering and operations personnel led to the belief that a passageway existed between rooms 1203 and 1204 when it did not.

Inspection Report# : [2016001](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

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.

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Miscellaneous

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