

## Callaway

# 3Q/2016 Plant Inspection Findings

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### 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*)

**Significance:**  Dec 31, 2015

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Failure to Follow Plant Procedure for Unit Reliability Team**

The inspectors reviewed a self-revealing finding for the licensee's failure to follow plant procedures for the unit reliability team. Specifically, after delaying a modification to the plant's turbine control system, no compensatory measures were implemented to minimize or prevent failure of the system due to aging of the system beyond its evaluated service life as required by plant Procedure APA-ZZ-00549, Appendix E, "Unit Reliability Team Operations."

The licensee's failure to follow the plant procedure for the unit reliability team 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, as no compensatory measures were implemented after the digital upgrade to the turbine control system was deferred from the spring 2013 refueling outage to the spring 2016 refueling outage, the turbine control system malfunctioned causing a runback of the turbine and downpower transient on the plant. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," 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 in the teamwork component of the human performance cross-cutting area because the licensee did not ensure that individuals and work groups communicate across organizational boundaries to ensure nuclear safety is maintained. Specifically, the outage leadership team identified the need for the compensatory measures, but did not communicate the priority nor the effect on nuclear safety to site leadership to gain the resources needed to implement these measures.

Inspection Report# : [2015004](#) (pdf)

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## 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:**  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:** G 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 shiftily 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)

**Significance:**  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Verify the Suitability of the Design of the Reverse-Engineered Replacement Controller Cards for the Auxiliary Feedwater Flow Control Valves**

The team identified a non cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to assure that the design of the replacement reverse engineered Modutronics controller cards for the auxiliary feedwater control valves were suitable for their application. Specifically, as of August 11, 2015, the licensee failed to establish suitable interface requirements in procurement documents to Nuclear Logistics Incorporated (the vendor) and verify the adequacy of the design by either design reviews or testing. Specifically, the team identified that neither the licensee nor the vendor had performed a design review sufficient to assure that the Modutronics controller cards were suitable for their application. In addition, the licensee had not provided the vendor with sufficient information to reverse engineer the controller cards. Lastly, neither the licensee nor the vendor performed testing sufficient to verify the adequacy of the design of the new Modutronics controller cards. As a result, the replacement cards were supplied with motor field current rectifier bridges that were undersized and marginal for their application, such that two of them failed in service, rendering these auxiliary feedwater system valves inoperable. Following performance of a root cause analysis, the licensee replaced the deficient controller cards with those of a higher current rating. The licensee initiated Callaway Action Request 201505796 to place this item into the corrective action program.

The failure to ensure that the design of the replacement for the Modutronics cards was suitable for their application was a performance deficiency. This performance deficiency is more than minor, and therefore, a finding because it adversely affected 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. Specifically, design deficiencies associated with these circuit cards resulted in the inoperability of auxiliary feedwater control valves and their ability to operate on demand. The team performed an initial screening of the finding in accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance

Determination Process (SDP) for Findings At Power.” Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the team determined that the finding required a detail risk evaluation because it represented the potential loss of one train of safety-related equipment (auxiliary feedwater) for greater than the technical specification allowed outage time. A Region IV senior reactor analyst performed a detailed risk evaluation in accordance with Appendix A, Section 6.0, “Detailed Risk Evaluation,” which determined that the finding was of very low safety significance (Green). The analyst determined that the importance of the failure of valves ALHV0005 and ALHV0007 was based on the postulated failure time of the turbine driven auxiliary feedwater pump because this determined the position in which the valves failed. The internal events incremental conditional core damage probability was  $8.17 \times 10^{-7}$ . The analyst also determined that the finding had only a minimal effect on external initiator risk and that the finding would not involve a significant increase in the risk of a large, early release of radiation.

This finding has a human performance cross cutting aspect in the area of teamwork, because individuals in different work groups did not appropriately communicate across organizational boundaries. Specifically, licensee personnel did not adequately communicate the design and testing requirements for the reverse engineered cards.(H.4)

Inspection Report# : [2015009](#) (pdf)

**Significance:** G Nov 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Have an Adequate Procedure for Calibration of the Auxiliary Feedwater Pump Flow Control Valve Potentiometer**

The team reviewed a self revealing non cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for failure to prescribe activities affecting quality using procedures appropriate to the circumstances. Specifically, on November 18, 2009, the licensee revised Procedure MTE ZZ QA033, “MOVATS UDS [motor operated valve actuator test system universal diagnostic system] Testing of Torque Controlled Modutronics Limitorque Motor Operated Rising Stem Valves,” Revision 3, to incorporate a second method of valve testing, and introduced an error in bypassing a test of the Modutronics board setup feedback potentiometer. As a result, on July 23, 2015, the actuator misinterpreted the actual position of the valve, which subsequently failed to open when operators attempted to open the valve following a forced reactor shutdown. In response to this issue, the licensee has reviewed all maintenance and test activities that could affect the potentiometer and has revised the appropriate procedures. This finding was entered into the licensee’s corrective action program as Callaway Action Request 201505332.

The failure to provide a procedure appropriate to the circumstances for an auxiliary feedwater system flow control valve was a performance deficiency. This finding was more than minor, and therefore, a finding because it adversely affected the Mitigating Systems Cornerstone attribute of Procedure Quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to provide a procedure appropriate to the circumstances to set up an auxiliary feedwater system flow control valve feedback potentiometer resulted in its inability to operate manually on demand. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance, because it did not affect system design, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non technical specification trains of equipment designated as high safety significance. The valve would have automatically throttled auxiliary feedwater flow to approximately 300 gpm on demand. This finding did not have a cross-cutting aspect because the procedure revision resulting in the inadequate procedure was issued in 2009, and previous opportunities to correct the procedure occurred in 2010. Thus, this performance deficiency was not indicative of current licensee performance.

Inspection Report# : [2015009](#) (pdf)

**Significance:**  Nov 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Have an Adequate Post-Maintenance Test for Setting the Motor-Driven Auxiliary Feedwater Flow Control Valve Modutronics Potentiometer**

The team reviewed a self revealing non cited violation of 10 CFR Part 50, Appendix B, Criterion XI, “Test Control,” for failure to ensure that testing demonstrated that structures, systems, and components will perform satisfactorily in service. Specifically, on October 24, 2014, the licensee failed to establish a suitable post maintenance test program to demonstrate that the motor driven auxiliary feedwater flow control valve Modutronics potentiometer had been set correctly after maintenance. The testing consisted of stroking the valve full open or full closed, and did not consider step changes in valve positioning and did not confirm the potentiometer feedback settings during valve positions that were not full open or full closed. In response to this issue, the licensee performed another calibration of the potentiometer, focusing on the potentiometer position during the valve stroke. The new post maintenance test included opening the valve in discreet step changes to test the valve position feedback potentiometer. This finding was entered into the licensee’s corrective action program as Callaway Action Request 201505332.

The failure to establish a suitable post maintenance test program to demonstrate that the motor driven auxiliary feedwater flow control valve Modutronics potentiometer would be set correctly after maintenance or testing was a performance deficiency. This finding was more than minor, and therefore, a finding because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to establish a post maintenance testing program for the motor driven auxiliary feedwater valve Modutronics potentiometer to verify that the potentiometer was set correctly, resulted in valve ALHV0011 failing to open when operators initiated a signal to place the valve in an open position. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings at Power,” Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather. The team determined that this finding did not have a cross cutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2015009](#) (*pdf*)

**Significance:**  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Two Examples of a Failure to Properly Designate the Significance Level of Callaway Action Requests**

The team identified two examples of a non cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to implement their corrective action program procedure. Specifically: (1) on November 20, 2014, the licensee designated the improper setting of the auxiliary feedwater flow control valve ALHV005 limit switches as Significance Level 5 (administrative close) instead of Significance Level 3 (lower tier cause evaluation) and (2) on December 9, 2014, the licensee downgraded the failure of the Modutronics card for valve ALHV0005 from Significance Level 1 (root cause analysis) to Significance Level 3 based on unverified assumptions of the failure mechanisms. Following failure of the Modutronics card for valve ALHV0005, the licensee assumed that the early failure was due to a manufacturing defect (infant mortality) without supporting data to prove this designation. The licensee entered these issues into the corrective action program as Callaway Action Requests 201506921 and 201507235.

The two failures to properly designate the Significance Level of Callaway action requests constitute a performance deficiency. This finding was more than minor, and therefore, a finding because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failures to properly designate the significance of the conditions precluded determining the appropriate cause determinations and extent of conditions and resulted in failure to correct the conditions before they further manifested themselves following a trip. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance, because it did not affect system design, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non technical specification trains of equipment designated as high safety significance. This finding has a human performance cross cutting aspect in the area of conservative bias in that the decision-making did not demonstrate a conservative/prudent choice in designating the significance level of the Callaway action requests based on two cases of unverified/incorrect information.(H.14)

Inspection Report# : [2015009](#) (pdf)

**Significance:**  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Determine the Cause and Take Corrective Action to Preclude Repetition for the Inadequate Design of Auxiliary Feedwater Flow Control Valve Modutronics Cards**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to determine the cause and take corrective action to preclude repetition for a significant condition adverse to quality. Specifically, on May 21, 2015, the licensee received new information that refuted the previously assumed failure mechanism for AFW flow control valve ALHV0005 documented in December 2014, but failed to initiate a new Callaway action request to document the new information and report it to appropriate levels of management. As a result, the licensee failed to identify the failure of the valve as a significant condition adverse to quality, determine the cause, initiate a prompt operability assessment, and identify corrective action to preclude repetition until valve ALHV0007 failed, for the same reason, following a reactor trip on August 11, 2015. The licensee entered this issue into the corrective action program as Callaway action request 201506846.

The failure to determine the cause and take corrective action to preclude repetition for a significant condition adverse to quality when failure analysis indicated that a significant defect existed on valves ALHV0005 and ALHV0007 was a performance deficiency. This finding was more than minor, and therefore, a finding, because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure of the licensee to determine the cause and take corrective action to preclude repetition for a significant condition adverse to quality when new information on the failure mechanism was received precluded determining the root cause and extent of condition and the performance of an operability determination, which resulted in failure to correct the condition before it further manifested itself following a reactor trip. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance, because it did not affect system design, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non technical specification trains of equipment designated as high safety significance. This finding has a human performance cross cutting aspect in the area of consistent process in that the individuals that received the information concerning the failure mechanism of the Modutronics cards failed to use a systematic approach to documenting the information and communicating it to appropriate levels of management.(H.13)

Inspection Report# : [2015009](#) (pdf)

**Significance:**  Nov 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Have an Adequate Procedure for Testing the Torque and Thrust Values for the Auxiliary Feedwater Pump Flow Control Valves**

The team reviewed a self revealing non cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for failure to provide a procedure appropriate to the circumstances. Specifically, on March 4, 2014, the licensee performed Job 08505547, and had not correctly accounted for the differential pressure the valve would actually experience, and had incorrectly set and tested the close torque switch on valve ALHV0005. As a result, On November 15, 2015, during steam generator filling operations, Valve ALHV0005 failed to move in the closed direction when the torque switch opened. The incorrect close torque switch setting prevented the valve from going full closed. In response to this issue, the licensee, using Job 14005755, repaired the valve, and confirmed that the close torque switch settings were correct and successfully retested. This finding was entered into the licensee’s corrective action program as Callaway Action Report 201508399.

The failure to establish a procedure that included a suitable instructions to set the torque switch on a motor driven AFW valve after maintenance or testing was a performance deficiency. This finding was more than minor, and therefore, a finding because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to establish a post maintenance testing program for the motor driven auxiliary feedwater valve torque and thrust settings caused valve ALHV0005 not to close completely, causing the operators to take action and shut down motor driven feedwater pump B. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings at Power,” Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather. The team determined that this finding had a cross cutting aspect in the area of human performance, challenge the unknown, because the licensee did not stop and challenge that the tested differential pressure across valve ALHV0005 was significantly different than the other valves.(H.11)

Inspection Report# : [2015009](#) (pdf)

**Significance:**  Nov 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Identify and Correct Additional Undersized Components on Auxiliary Feedwater System Flow Control Valve Modified Modutronics Controller Cards**

The team identified a non cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to identify and correct a condition adverse to quality. Specifically, as of September 23, 2015, the licensee had not taken corrective action, following previous identification of undersized field current rectifier bridges, to ensure that an independent review of the modified circuit design had been completed, or that the modified cards had been subjected to a sufficient testing and qualification program. Thus, following questioning by the team, the licensee identified additional components (two other rectifier bridges) on the newly modified circuit cards that were also potentially undersized. The licensee performed an operability evaluation and concluded that the new cards were operable, based on additional circuit analysis that was performed. This issue was entered into the corrective action program as Callaway Action Request 201506874.

The failure to identify and correct a condition adverse to quality was a performance deficiency. This performance

deficiency is more than minor, and therefore, a finding because it adversely affected the Mitigating Systems Cornerstone attribute of Equipment Performance and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to identify and correct design deficiencies associated with these circuit cards could have resulted in the inoperability of auxiliary feedwater control valves and their inability to operate on demand. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance, because it did not affect system design, did not result in a loss of system function, did not represent a loss of function of a single train for greater than its technical specifications allowed outage time, and did not cause the loss of function of one or more non technical specification trains of equipment designated as high safety significance. This finding has a human performance cross cutting aspect in the area of Avoid Complacency, because the licensee did not thoroughly evaluate the issue to ensure that the resolutions address causes and extent of conditions. Specifically, the licensee had identified that the Modutronics cards failed because of improper design of the field current rectifier bridge, but did not plan for the possibility for other latent issues to determine if other components on the cards were adequately sized for their application.(H.12)  
Inspection Report# : [2015009](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Dec 31, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Promptly Correct a Condition Adverse to Quality on the Reactor Coolant System**

The inspectors reviewed a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to correct a condition adverse to quality. Specifically, after identifying boric acid deposits on the flange downstream of valve BBV0400, a reactor coolant system boundary valve, the licensee did not promptly take action to stop the reactor coolant system leakage before it worsened and caused a plant shutdown due to reactor coolant system leakage in excess of technical specification limits. The immediate corrective action was to torque the valve and flange to reduce leakage to within limits. The licensee entered this issue into their corrective action program as Callaway Action Request 201505308.

The licensee’s failure to correct the condition adverse to quality (i.e. leakage past valve BBV0400) in a timely manner was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the reactor coolant system equipment and barrier performance attribute of the Barrier Integrity Cornerstone and adversely affected the 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. Specifically, the failure to correct the reactor coolant system leakage through valve BBV0400 resulted in reactor coolant system leakage worsening and exceeding technical specification limits, and a plant shutdown. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, “Initiating Events Screening Questions,” dated June 19, 2012, the finding was determined to be of very low safety significance because after a reasonable assessment of degradation, it could not: 1) result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, or 2) have likely affected other systems used to mitigate a loss of coolant accident resulting in a total loss of their function. This finding has a cross-cutting aspect in the work management component of the human performance cross-cutting area because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee initially planned to address the reactor coolant leakage six months after the issue was identified, and then moved it out an additional three months, failing to prioritize the work commensurate with its safety significance.

Inspection Report# : [2015004](#) (*pdf*)

**Significance:** G Dec 31, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Properly Establish and Maintain a Plant Procedure for Preparation for Refueling Outages**

The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 5.4.1, "Procedures," for the licensee's failure to establish, implement, and maintain a procedure recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Specifically, Procedure ODP-ZZ-00022, "Operations Preparation, Performance, and Restoration from Refueling Outages," did not provide adequate guidance to ensure a blind flange located on the reactor coolant system was properly reinstalled resulting in reactor coolant system leakage into containment. The immediate corrective action taken by the licensee was to replace the gasket with a Flexitallic gasket and torque the flange. Additionally, the licensee implemented repetitive maintenance tasks in their work management program to identify flanges removed during an outage and to torque them properly upon reinstallation. The licensee entered this issue into their corrective action program as Callaway Action Request 201505702.

The licensee's failure to properly establish and maintain Procedure ODP-ZZ-00022 was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the procedure quality performance attribute of the Barrier Integrity Cornerstone and adversely affected the 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. Specifically, Procedure ODP-ZZ-00022, did not provide adequate guidance to ensure the blind flange located downstream of valve BBV0400 was properly reinstalled. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance because after a reasonable assessment of degradation, it could not: 1) result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, or 2) have likely affected other systems used to mitigate a loss of coolant accident resulting in a total loss of their function. This finding does not have a cross-cutting aspect because the performance deficiency is not representative of current licensee performance, in that the inadequate instructions were added to the procedure in 2003.

Inspection Report# : [2015004](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## 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

Last modified : December 08, 2016