



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

August 3, 2015

EA-15-152

Mr. Fadi Diya, Senior Vice President
and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT – NRC INTEGRATED INSPECTION
REPORT 05000483/2015002 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Diya,

On June 20, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. On July 1, 2015, the NRC inspectors discussed the results of this inspection with Mr. D. Neterer, Vice President, Nuclear Operations, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you disagree with a cross-cutting aspect in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV; and the NRC resident inspector at the Callaway Plant.

The inspectors also reviewed Licensee Event Report 05000483/2014-003-01, which describes that inverter NN11 unexpectedly transferred from its normal direct current source to its bypass alternating current source. Investigation identified a loose mounting screw that secures disconnect switch NN01-11 to safety-related bus NN01. The direct cause of this event was inadequate thread engagement of the screw securing the switch to the NN01 bus. The presence of threads in the switch mounting hole (which are not intended to engage with the bus bar termination screw) introduced the potential for binding during screw installation. The detail of this mounting configuration is not identified on plant drawings of the cabinet or switch provided by the vendor and nothing in the work control process required a detailed comparison of the switch to the work procedures and, as such, it was reasonable that this potential vulnerability was not identified and addressed in the procedure or pre-job walkdown. During the actual installation of the screw, the screw appeared flush and tight with the switch mounting

board, meeting the requirements of the work package. The equipment was successfully post-maintenance tested and technical specification surveillance tested for a period of 6 years. There was also no industry or vendor Operating Experience describing this vulnerability. The inspectors concluded that it was not reasonable for Callaway staff to foresee and correct this condition; accordingly, the NRC did not identify a licensee performance deficiency. The NRC performed a risk evaluation of the issue and determined it to be of very low safety significance. Based on these facts, I have been authorized, after consultation with the Director, Office of Enforcement, and the Regional Administrator, to exercise enforcement discretion in accordance with NRC Enforcement Policy Section 2.2.4, "Exceptions to Using Only the Operating Reactor Assessment Program," and Section 3.5, "Violations Involving Special Circumstances," and refrain from issuing enforcement for the violation.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA R. Lantz for/

Troy Pruett, Director
Division of Reactor Projects

Docket No. 50-483
License No. NPF-30

Enclosure:
Inspection Report 05000483/2015002
w/ Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

board, meeting requirements of the work package. The equipment was successfully post maintenance tested and technical specification surveillance tested for a period of 6 years. There was also no industry or vendor Operating Experience describing this vulnerability. The inspectors concluded that it was not reasonable for Callaway staff to foresee and correct this condition; accordingly, the NRC did not identify a licensee performance deficiency. The NRC performed a risk evaluation of the issue and determined it to be of very low safety significance. Based on these facts, I have been authorized, after consultation with the Director, Office of Enforcement, and the Regional Administrator, to exercise enforcement discretion in accordance with Section 3.5 of the Enforcement Policy and refrain from issuing enforcement for the violation.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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Letter to Fadi Diya from Troy Pruett dated August 3, 2015

SUBJECT: CALLAWAY PLANT – NRC INTEGRATED INSPECTION
REPORT 05000483/2015002 AND EXERCISE OF ENFORCEMENT DISCRETION

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000483

License: NPF-30

Report: 05000483/2015002

Licensee: Union Electric Company

Facility: Callaway Plant

Location: Junction Highway CC and Highway O

Dates: March 22 through June 20, 2015

Inspectors: T. Hartman, Senior Resident Inspector
M. Langelier, P.E., Resident Inspector
P. Elkmann, Senior Emergency Preparedness Inspector
G. Guerra, CHP, Emergency Preparedness Inspector
M. Brooks, Physical Security Inspector
M. Poston-Brown, Nuclear Materials Inspector

Approved By: T. Pruett, Director
Division of Reactor Projects

SUMMARY

IR 05000483/2015002; 03/22/2015 – 06/20/2015; Callaway Plant, Integrated Resident and Regional Report; Maintenance Risk Assessments and Emergent Work Control and Operability Determinations and Functionality Assessments.

The inspection activities described in this report were performed between March 22 and June 20, 2015, by the resident inspectors at the Callaway Plant and inspectors from the NRC's Region IV office. Two findings of very low safety significance (Green) are documented in this report. Both of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green. 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 properly implement procedure directed compensatory actions necessary for operability of safety-related equipment. Specifically, when the train B class 1E switchgear air conditioning unit (SGK05B) was taken out of service for maintenance, compensatory measures to open all of the doors between both trains of engineered safety feature ac and dc switchgear and batteries were not implemented correctly. This resulted in less than calculated minimum cooling air flow required under accident conditions to support operability of the associated switchgear. The licensee entered this issue into their corrective action program as Callaway Action Request 201503501. The corrective actions include revising the compensatory action procedures and providing training on the issue.

The licensee's failure to properly implement compensatory actions necessary to maintain operability of safety-related equipment in accordance with plant procedures was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is similar to examples 3.i, 3.j, and 3.k in Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, between May 6 and 7, 2015, when the train B class 1E switchgear air conditioning unit (SGK05B) was taken out of service for maintenance, compensatory measures to open all of the doors between both trains of vital batteries, chargers, and engineered safety feature switchgear were not implemented correctly and when discovered required significant evaluation to determine the operability status of the supported equipment during the maintenance. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," 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 cross-cutting aspect of "Challenge the Unknown" in the human

performance cross-cutting area because individuals did not stop when faced with uncertain conditions and risks were not evaluated and managed before proceeding. Specifically, operations personnel did not question why they were only opening one door of a double door set when implementing the compensatory measures to allow cool air in the air conditioned rooms to cool the rooms without air conditioning [H.11]. (Section 1R13)

- Green. 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 evaluation on the train A emergency diesel generator when required support equipment was taken out of service for maintenance. This resulted in necessary compensatory actions not being in place when the support equipment was taken out of service. The immediate corrective action taken by the licensee was to perform a prompt operability determination and implement compensatory measures. The licensee plans to evaluate the current planned maintenance process for safety related support equipment. The licensee entered this issue into their corrective action program as Callaway Action Request 201502708.

The licensee's failure to perform a prompt operability determination after bounding conditions were applied to the immediate operability determination per plant procedures 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 the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the failure of the licensee to perform an adequate operability evaluation resulted in the failure to implement required compensatory actions to maintain operability of the train A emergency diesel generator. Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," 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 work management cross-cutting aspect in the human performance cross-cutting area because the licensee did not appropriately implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, not having a clear work process for assessing operability of technical specification components when support systems are taken out of service for planned maintenance led to operators failing to adequately evaluate the operability of the train A emergency diesel generator [H.5]. (Section 1R15)

PLANT STATUS

Callaway operated at 100 percent power for the duration of the inspection period with the exception of planned power reductions for routine surveillances and post-maintenance testing.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Summer Readiness for Offsite and Alternate AC Power Systems

a. Inspection Scope

On June 9, 2015, the inspectors completed an inspection of the station's off-site and alternate-ac power systems. The inspectors inspected the material condition of these systems, including transformers and other switchyard equipment to verify that plant features and procedures were appropriate for operation and continued availability of off-site and alternate-ac power systems. The inspectors reviewed outstanding work orders and open Callaway action requests for these systems. The inspectors walked down the switchyard to observe the material condition of equipment providing off-site power sources.

These activities constituted one sample of summer readiness of off-site and alternate-ac power systems, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On March 24, 2015, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions. The inspectors reviewed plant design features, the licensee's procedures to respond to thunderstorms, and the licensee's implementation of these procedures. The inspectors walked down outside areas that would be susceptible to wind generated missile hazards and evaluated the licensee's control of loose material in these areas. The inspectors assessed corrective actions for identified degraded conditions and verified that the licensee had considered the degraded conditions in its risk evaluations and had established appropriate compensatory measures.

These activities constituted one sample of readiness for impending adverse weather conditions, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- April 28, 2015, train B motor-driven auxiliary feedwater pump
- May 11, 2015, train B class 1E electrical equipment air conditioning system
- June 12, 2015, train A class 1E electrical equipment air conditioning system

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems or trains were correctly aligned for the existing plant configuration.

These activities constituted three partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On June 14, 2015, the inspectors performed a complete system walkdown of the containment spray system. The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- April 21, 2015, train A emergency diesel generator room, area D-1
- May 11, 2015, access control and electrical equipment air conditioner units room Number 2, area C-14
- May 12, 2015, train A and train B switchgear rooms, areas C-9 and C-10
- June 12, 2015, boron injection tank room, area A-7

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

.2 Annual Inspection

a. Inspection Scope

On May 18, 2015, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of a turbine lube oil storage tank room fire drill.

During this drill, the inspectors evaluated the capability of the fire brigade members, the leadership ability of the brigade leader, the brigade's use of turnout gear and fire-fighting equipment, and the effectiveness of the fire brigade's team operation. The inspectors also reviewed whether the licensee's fire brigade met NRC requirements for training, dedicated size and membership, and equipment.

These activities constituted one annual inspection sample, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On June 9, 2015, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected safety-related electrical manhole MH01B that contained risk-significant cables whose failure could disable risk-significant equipment. The inspectors observed the material condition of the cables and splices contained in the manhole and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and manhole met design requirements.

These activities constitute completion of one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

On May 6, 2015, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors reviewed the data from a performance test and observed the licensee's inspection of the train B class 1E switchgear air conditioning unit condenser and the material condition of the heat exchanger internals. Additionally, the inspectors walked down the train B class 1E switchgear air conditioning unit to observe its performance and material condition.

These activities constitute completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On May 18, 2015, the inspectors observed simulator training for operating crew 2. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed the performance of on-shift licensed operators in the plant's main control room. The inspectors observed the operators' performance of the following activities:

- June 12, 2015, Procedure OSP-BB-00009 and fire alarm trouble alarm at the technical support center
- June 18, 2015, operations shift turnover with initial license training students on shift

In addition, the inspectors assessed the operators' adherence to plant procedures, including Procedure ODP-ZZ-00001, "Operations Department – Code of Conduct," and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

On June 16, 2015, the inspectors reviewed the licensee's periodic 10 CFR 50.65(a)(3) assessment of the Maintenance Rule Program.

The inspectors verified that a periodic evaluation was completed within the time constraints of 10 CFR 50.65(a)(3). The inspectors also verified that the licensee reviewed its (a)(1) goals, (a)(2) performance criteria, monitoring, preventive maintenance activities, effectiveness of corrective actions, and that industry operating experience was taken into account where practicable.

These activities constituted completion of one maintenance effectiveness sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed four risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- March 31, 2015, turbine-driven auxiliary feedwater pump technical specification outage and ALHV0012
- April 7, 2015, train B emergency diesel generator/essential service water/ultimate heat sink technical specification outage
- April 15, 2015, train A emergency diesel generator supply fan work, Job 13000678
- May 5, 2015, train B control building heating ventilation and air conditioning system technical specification outage, Job 13513168

The inspectors verified that these risk assessments were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

Additionally, on April 14, 2015, the inspectors observed portions of train B control room air conditioning system emergent work activities, Job 15503379, that had the potential to affect the functional capability of mitigating systems.

The inspectors verified that the licensee appropriately developed and followed work plans for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected structures, systems, and components.

These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to properly implement procedure directed compensatory actions necessary for operability of safety-related equipment. Specifically, when the train B class 1E switchgear air conditioning unit (SGK05B) was taken out of service for maintenance, procedure directed compensatory measures to open all of the doors between both trains of engineered safety feature ac and dc switchgear and batteries were not implemented correctly, thus calculated minimum cooling air flow was not maintained while in this incorrect configuration.

Description. Between May 6, 2015, at 7:00 a.m. and May 7 at 12:11 p.m., the train B class 1E switchgear air conditioning unit (SGK05B) was out of service for a planned maintenance outage. This air conditioning unit cools the control building rooms that contain the train B engineered safety feature ac and dc switchgear and battery. To maintain the supported equipment operable when the class 1E air conditioning unit is out of service, the station has determined using engineering calculation NAI-1719-001, Revision 1, Addendum 1, that adequate cooling is provided to these affected rooms using the opposite train class 1E air conditioning unit when the doors between the trains are opened. Of the fourteen doors used in the calculation, four doors (DSK 33011, 33023, 34041, and 34042) are double door sets with both doors of the set open in the calculation. Callaway has translated the requirements to support operability of the supported equipment (i.e., compensatory actions) based on this calculation into a standing order, "Actions for Inoperability of Class 1E A/C Unit," and a limiting condition of operation within Final Safety Analysis Report Chapter 16.7.13 "Class 1E Electrical Equipment Air Conditioning (A/C)."

The standing order, "Actions for Inoperability of Class 1E A/C Unit," Revision 9, states, in part, "For a planned Class 1E A/C Unit inoperability, perform the following actions prior to making the unit inoperable: 1. Enter the Required actions of FSAR 16.7.13; 2. Perform OTN-GK-00001, Section 5.11, to implement FSAR Action 16.7.13.1.a." Final Safety Analysis Report Action 16.7.13.1.a states, in part, "If the associated Class 1E A/C Unit (SGK05A/B) is inoperable, the ESF switchgear and vital batteries/chargers may be considered OPERABLE for up to 7 days provided the following conditions are met: 1) All doors between both trains of vital batteries/chargers (2016') and ESF switchgear (2000') are open." Procedure OTN-GK-00001, "Control Building HVAC System," Revision 44, Section 5.11, states in part, "On the 2000 ft elevation, OPEN Doors 33023 and 33011. On the 2016 ft elevation, OPEN Doors 34041, 34042, 34051, 34052, 34101, 34111, 34081, 34082, 34072, 34141, 34071, and 34131."

During a walkdown of the engineered safety feature switchgear rooms and the battery and charger rooms, inspectors noted that only one door of the double door sets (DSK 33011, 33023, 34041, and 34042) were open. Upon review of the engineering calculation (NAI-1719-001, Revision 1, Addendum 1) inspectors noted that the model in the calculation assumed both doors were open for the double door sets. Based on inspector concerns, the licensee initiated Callaway Action Request 201503501. Because the wording in Procedure OTN-GK-00001 regarding opening doors DSK 33023, 33011, 34041, and 34042 did not specify both doors of the double door set, the licensee concluded that only one door of the double door sets may have been opened each time these compensatory measures were implemented. From May 2012 through May 2015 one of the class 1E air conditioning units was out of service and the compensatory measures were required 41 times for a total of approximately 505 hours. As part of a past operability evaluation, the licensee reanalyzed the engineering calculation using the model with one door of the double door sets open. The results of this calculation showed that the temperature in two of the rooms would exceed the environmental quality limits previously evaluated for the components in the rooms. Because of this result, the licensee reevaluated the inputs and assumptions in the model to remove conservatisms that were in the original model including using historical atmospheric conditions during the times that the class 1E air conditioning units were out of service instead of worst case atmospheric conditions. The results of the analysis using the new model showed that the equipment in the affected room would still be able

to perform its safety function for its required mission time for the times that the class 1E air conditioning units were out of service for maintenance within the last three years.

Analysis. The licensee's failure to properly implement compensatory actions necessary to maintain operability of safety-related equipment in accordance with plant procedures was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is similar to examples 3.i, 3.j, and 3.k in Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, when the train B class 1E switchgear air conditioning unit (SGK05B) was taken out of service for maintenance on May 6 and 7, 2015, compensatory measures to open all of the doors between both trains of vital batteries, chargers, and engineered safety feature switchgear were not implemented correctly and when discovered required significant evaluation to determine the operability status of the supported equipment during the maintenance. Operability was in reasonable doubt since cooling air flow was below the minimum values specified in the calculation and the licensee had to develop a revision to their design GOTHIC Model revising assumptions and removing conservatisms.

Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," 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 cross-cutting aspect of "Challenge the Unknown" in the human performance cross-cutting area because individuals did not stop when faced with uncertain conditions and risks were not evaluated and managed before proceeding. Specifically, operations personnel did not question why they were only opening one door of a double door set when implementing the compensatory measures that were being done to allow cool air in the air conditioned rooms to cool the rooms without air conditioning [H.11].

Enforcement. Title 10 of the *Code of Federal Regulations*, Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be accomplished in accordance with procedures. Implementation of compensatory measures to ensure operability of engineered safety feature ac and dc switchgear and batteries is an activity that affects quality. This activity was partially accomplished using Final Safety Analysis Report Chapter 16.7.13.1 which states in part, "If the associated Class 1E A/C Unit (SGK05A/B) is inoperable, the ESF switchgear and vital batteries/chargers may be considered OPERABLE for up to 7 days provided the following conditions are met: 1) All doors between both trains of vital batteries/chargers (2016') and ESF switchgear (2000') are open." Contrary to the above, from May 6 through 7, 2015, the licensee did not implement activities affecting quality in accordance with procedures. Specifically, the licensee failed to properly implement the compensatory actions necessary to maintain the engineered safety feature ac and dc switchgear and batteries operable during a planned maintenance outage of the train B class 1E air conditioning unit (SGK05B). Because this violation was of very low safety significance (Green) and was entered into the licensee's

corrective action program as Callaway Action Request 201503501, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000483/2015002-01, "Failure to Properly Implement Compensatory Actions as Directed by Procedure."

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed four operability determinations that the licensee performed for degraded or nonconforming structures, systems, or components:

- April 10, 2015, operability determination of train A emergency diesel generator fuel oil storage tank diesel fuel delivery out of specification for cloud point, Callaway Action Request 20102555
- April 15, 2015, operability determination of train A emergency diesel generator fan out of service for modification, Callaway Action Request 201502678
- April 25, 2015, operability determination of train A residual heat removal minimum flow control valve loose conduit shield on cable, Callaway Action Request 201502920
- May 19, 2015, operability determination of train A centrifugal charging pump motor inboard bearing drain plug broken, Callaway Action Request 201503606

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded structures, systems, and components to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded structures, systems and components.

These activities constitute completion of four operability and functionality review samples as defined in Inspection Procedure 71111.15.

b. Findings

Introduction. The inspectors identified a Green, 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 evaluation on the train A emergency diesel generator when required support equipment was taken out of service for maintenance. Specifically, a prompt operability determination was not completed when bounding conditions were applied to the immediate operability determination as required by licensee Procedure ODP-ZZ-00001, Addendum 15, "Operability and Functionality Determinations." This resulted in necessary compensatory actions not being in place when the support equipment was taken out of service and thus potentially affecting operability of the emergency diesel generator.

Description. On April 15, 2015, at 3:45 a.m., the train A emergency diesel generator building supply fan was taken out of service for planned maintenance. As part of the

maintenance planning, an engineering calculation (GM-03, Revision 2, Addendum 3) was completed to determine the 7-day temperature profile of the train A emergency diesel generator room with the failure of the supply fan for weather conditions in the month of April. As the supply fan is part of a required support system for the train A emergency diesel generator, a control room log entry was made stating the train A emergency diesel generator remained operable with the fan out of service based on the engineering calculation. Upon review by inspectors, it was determined that the engineering calculation was based on an older calculation (GM-03, Revision 2) and that in a similar situation associated with the train B emergency diesel generator and supply fan, compensatory actions were necessary to meet the assumptions of the older engineering calculation and operability. Additionally, inspectors determined that the licensee had not performed a prompt operability determination as required by Procedure ODP-ZZ-00001 when bounding conditions were applied to an immediate operability determination (i.e., the engineering calculation applied only to the month of April).

Per plant procedures, the operability determination process is entered as part of the corrective action program. Because the train A diesel generator building supply fan was taken out of service as part of planned maintenance, the operability evaluation was done outside of the normal process and led to failing to perform the prompt operability determination as required by procedures and failing to implement necessary compensatory actions.

On April 15, at approximately 5:00 p.m. the licensee initiated Callaway Action Request 201502678 and subsequently completed an immediate and prompt operability determination as initial corrective actions. The prompt operability determination concluded that compensatory actions were necessary to maintain operability of the train A emergency diesel generator. These compensatory actions included opening breakers to the four room heaters in the train A emergency diesel generator room to prevent inadvertently energizing the heaters and adding additional heat into the room which would challenge the basis of the engineering calculation. A revision to the prompt operability determination that included a non-compensatory action of monitoring outside ambient temperature was completed after additional questions were posed by the NRC inspectors.

Analysis. The licensee's failure to perform a prompt operability determination after bounding conditions were applied to the immediate operability determination per plant procedures 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 the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure of the licensee to perform an adequate operability evaluation resulted in the failure to implement necessary compensatory actions to maintain operability of the train A emergency diesel generator.

Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," 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 work management cross-cutting aspect in the human performance cross-cutting area because the licensee did not appropriately implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, not having a clear work process for assessing operability of technical specification components when support systems are taken out of service for planned maintenance led to operators failing to adequately evaluate the operability of the train A emergency diesel generator [H.5].

Enforcement. Title 10 of the *Code of Federal Regulations*, Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be accomplished in accordance with procedures. Quality Procedure ODP-ZZ-00001, Addendum 15, "Operability and Functionality Determinations," step 3.2.5 states, in part, that "IF bounding or limiting conditions are applied to an Immediate OD, THEN a Prompt OD should be requested. Examples are: Time of year, as in summer or winter operating conditions." Contrary to the above, the licensee failed to accomplish activities affecting quality in accordance with procedures resulting in a support system for a safety related system being out of service for 13 hours on April 15, 2015, without necessary compensatory measures in place to ensure operability of the safety related system. Specifically, the licensee failed to request and complete a prompt operability determination when bounding conditions were applied to the immediate operability determination. As a result, compensatory actions required for operability of the train A emergency diesel generator were not implemented for 13 hours while the building supply fan was out of service for maintenance. Because this violation was of very low safety significance (Green) and was entered into the licensee's corrective action program as Callaway Action Request 201502708, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000483/2015002-02, "Inadequate Operability Evaluation When Taking Emergency Diesel Generator Support Equipment Out of Service."

1R18 Plant Modifications (71111.18)

Permanent Modifications

a. Inspection Scope

On April 15, 2015, the inspectors reviewed a permanent plant modification to the train A emergency diesel generator fan motor replacement, Modification Package 13-002, that affected risk-significant structures, systems, and components.

The inspectors reviewed the design and implementation of the modification. The inspectors verified that work activities involved in implementing the modification did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the functionality of the structure, system, or component as modified.

These activities constitute completion of one sample of permanent modifications, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed six post-maintenance testing activities that affected risk-significant structures, systems, or components:

- April 8, 2015, train B emergency diesel generator/essential service water/ultimate heat sink technical specification outage, Job 13513470
- April 22, 2015, train A emergency diesel generator fan motor replacement, Job 13000678
- April 29, 2015, train B motor-driven auxiliary feedwater pump oil change out, Job 14502242
- May 7, 2015, train B control building heating ventilation and air conditioning post-maintenance test, Job 13513168
- June 11, 2015, train A class 1E air conditioning unit technical specification outage, Job 13501254
- June 17, 2015, train A control room air conditioning unit technical specification outage, Job 14501129

The inspectors reviewed licensing- and design-basis documents for the structures, systems, or components and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected structures, system, or components.

These activities constitute completion of six post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed seven risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the structures, systems, and components were capable of performing their safety functions:

In-service tests:

- April 27, 2015, train B residual heat removal system

Containment isolation valve surveillance tests:

- May 27, 2015, GSHV0018 local leak rate test

Reactor coolant system leak detection tests:

- June 12, 2015, reactor coolant system water inventory balance

Other surveillance tests:

- April 1, 2015, pressurized reactor coolant system sample
- April 2, 2015, load shedding and emergency load sequencing testing
- May 4, 2015, train B solid state protection system slave relay K634 and K744 test
- June 10, 2015, essential service water/service water leak testing

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected structures, systems, and components following testing.

These activities constitute completion of seven surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an on-site review of:

- Callaway Radiological Emergency Response Plan, Revision 46
- Procedure EIP-ZZ-00101 "Classification of Emergencies," Revision 51
- Procedure EIP-ZZ-00101, Addendum 2, "Emergency Action Level Technical Basis Document," Revision 9
- Procedure EIP-ZZ-00212, "Protective Action Recommendations," Revision 27

These revisions:

- Added references to an independent spent fuel storage installation (ISFSI) to the Radiological Emergency Response Plan

- Added new emergency action level E-HU1, “Damage to a loaded MPC (Cask) Confinement Boundary”
- Added the ISFSI to initiating conditions for existing emergency action levels HA 4.1 and HS 4.1
- Added definitions for confinement boundary, multi-purpose canister, spent fuel storage cask, and other terms related to the ISFSI installation
- Added references to 10 CFR 72.48
- Clarified the criteria for issuing an evacuation protective action recommendation for the public as a change to an existing shelter-in-place recommendation

The revisions were compared to their previous revisions, to the criteria of NUREG-0654, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” Revision 1; to Nuclear Energy Institute Report 99-01, “Emergency Action Level Methodology,” Revision 5; and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q)(3) and 50.54(q)(4). The inspectors verified that the revisions did not reduce the effectiveness of the emergency plan. This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of four emergency action level and emergency plan change samples as defined in Inspection Procedure 71114.04.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed a hostile action based emergency preparedness drill on May 5, 2015, to verify the adequacy and capability of the licensee’s assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the simulator, and attended the post-drill critique. The inspectors verified that the licensee’s emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

1EP7 Exercise Evaluation – Hostile Action Event (71114.07)

a. Inspection Scope

The inspectors observed the licensee's May 5, 2015, biennial emergency plan exercise to verify the exercise acceptably tested the major elements of the emergency plan, provided opportunities for the emergency response organization to demonstrate key skills and functions, and demonstrated the licensee's ability to coordinate with offsite emergency responders. The scenario simulated the following to demonstrate the licensee's capability to implement its emergency plan under conditions of uncertain physical security:

- A fire in a running emergency diesel generator
- An armed attack on the protected area
- Injured plant employees
- Extensive damage to the plant fire protection system
- Damage to the refueling water storage tank
- Damage to the containment airlock hatch
- Damage to reactor coolant system piping causing a loss of coolant inside containment

During the exercise the inspectors observed activities in the control room simulator and the following emergency response facilities:

- Technical Support Center
- Operations Support Center
- Emergency Operations Facility
- Central and/or Secondary Alarm Stations
- Incident Command Post

The inspectors focused their evaluation of the licensee's performance on event classification, offsite notification, recognition of offsite dose consequences, development of protective action recommendations, staffing of alternate emergency response facilities, and the coordination between the licensee and offsite agencies to ensure reactor safety under conditions of uncertain physical security.

The inspectors also assessed recognition of, and response to, abnormal and emergency plant conditions, the transfer of decision making authority and emergency function responsibilities between facilities, onsite and offsite communications, protection of plant employees and emergency workers in an uncertain physical security environment,

emergency repair evaluation and capability, and the overall implementation of the emergency plan to protect public health and safety and the environment. The inspectors reviewed the current revision of the facility emergency plan, emergency plan implementing procedures associated with operation of the licensee's primary and alternate emergency response facilities, and procedures for the performance of associated emergency and security functions.

The inspectors attended the post-exercise critiques in each emergency response facility to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management.

The inspectors reviewed the scenarios of previous biennial exercises and licensee drills conducted between January 2013 and April 2015, to determine whether the May 5, 2015, exercise was independent and avoided participant preconditioning, in accordance with the requirements of 10 CFR 50, Appendix E, IV.F(2)(g). The inspectors also compared observed exercise performance with corrective action program entries and after-action reports for drills and exercises conducted between January 2013 and April 2015 to determine whether identified weaknesses had been corrected in accordance with the requirements of 10 CFR 50.47(b)(14), and 10 CFR 50, Appendix E, IV.F.

These activities constituted completion of one exercise evaluation sample as defined in Inspection Procedure 71114.07.

b. Findings

No findings were identified.

1EP8 Exercise Evaluation – Scenario Review (71114.08)

a. Inspection Scope

The licensee submitted the preliminary exercise scenario for the May 5, 2015, biennial exercise to the NRC on February 27, 2015, in accordance with the requirements of 10 CFR 50, Appendix E, IV.F(2)(b). The inspectors performed an in-office review of the proposed scenario to determine whether it would acceptably test the major elements of the licensee's emergency plan, and provide opportunities for the emergency response organization to demonstrate key skills and functions.

These activities constituted completion of one exercise evaluation sample as defined in Inspection Procedure 71114.08.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index: Heat Removal Systems (MS08)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of second quarter 2014 through first quarter 2015 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for heat removal systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of first quarter 2014 through fourth quarter 2014 to verify the accuracy and completeness of the reported data. The inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample on April 1, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system specific activity performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Reactor Coolant System Identified Leakage (BI02)

a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system identified leakage for the period of second quarter 2014 through first quarter 2015 to verify the accuracy and completeness of the reported data. The inspectors observed the

performance of Procedure OSP-BB-00009, "RCS Inventory Balance," on June 12, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system leakage performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors reviewed the licensee's evaluated exercises, emergency plan implementations, and selected drill and training evolutions that occurred between April 2014 and March 2015 to verify the accuracy of the licensee's data for classification, notification, and protective action recommendation opportunities. The inspectors reviewed a sample of the licensee's completed classifications, notifications, and protective action recommendations to verify their timeliness and accuracy. The inspectors used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted verification of the drill/exercise performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.5 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors reviewed the licensee's records for participation in drill and training evolutions between April 2014 and March 2015 to verify the accuracy of the licensee's data for drill participation opportunities. The inspectors verified that all members of the licensee's emergency response organization in the identified key positions had been counted in the reported performance indicator data. The inspectors reviewed the licensee's basis for reporting the percentage of emergency response organization members who participated in a drill. The inspectors reviewed drill attendance records and verified a sample of those reported as participating. The inspectors used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted verification of the emergency response organization drill participation performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.6 Alert and Notification System Reliability (EP03)

a. Inspection Scope

The inspectors reviewed the licensee's records of Alert and Notification System tests conducted between April 2014 and March 2015 to verify the accuracy of the licensee's data for siren system testing opportunities. The inspectors reviewed procedural guidance on assessing alert and notification system opportunities and the results of periodic alert and notification system operability tests. The inspectors used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted verification of the alert and notification system reliability performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

To verify that the licensee was taking corrective actions to address identified adverse trends that might indicate the existence of a more significant safety issue, the inspectors reviewed corrective action program documentation associated with the following licensee-identified trends:

- A negative trend involving operations personnel written instruction use and adherence (Callaway Action Requests 201500152, 201500338, and 201501415)
- A negative trend identified by the licensee's training organization involving inadvertent information transfer from the simulator to outside facilities (Callaway Action Request 201501157)

Also, the inspectors identified the following trend that might indicate the existence of a more significant safety issue, and reviewed the licensee's response to it:

- A negative trend related to operability determinations of safety-related equipment

These activities constitute completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Observations and Assessments

The inspectors' review of the trends identified above produced the following observations and assessments:

- For the negative trend involving operations personnel written instruction use and adherence, the licensee performed an evaluation of the causes for the negative trend. The licensee performed training, focusing on the weaknesses identified during the cause evaluation, and planned additional refresher presentations to operations personnel in the future.

The inspectors considered that in response to this trend the licensee had completed an appropriate evaluation and had developed appropriate corrective actions.

- For the negative trend involving inadvertent information transfer from the simulator to outside facilities, the licensee assigned an action to revise the procedures governing simulator communication equipment capabilities and place physical barriers on the phones to prohibit use during specific activities. At the end of the inspection period, these actions were ongoing.

The inspectors considered that in response to this trend the licensee had developed appropriate corrective actions.

- For the negative trend related to the operability determination of safety-related equipment, the licensee initiated Callaway Action Requests 201501400 and 201502186 due to multiple questions from the resident inspectors related to the justifications for reasonable assurance to maintain operability. The licensee has updated the operability determination templates in their corrective action program, has created training exercises for the licensed operators, and has operations management scoring operability determinations weekly.

The inspectors concluded that the licensee had implemented appropriate corrective actions to address this issue.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected one issue for an in-depth follow-up:

- On October 12, 2014, it was discovered that a job that was written for performing chemical degasification of the volume control tank during the refueling outage should have received a 10 CFR 50.59 modification screening for changing a procedure described in the Final Safety Analysis Report (i.e., plant chemistry control).

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of one annual follow-up sample as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

(Closed) Licensee Event Report 2014-003-01, Inverter NN11 Inadvertently Transferred to its Alternate AC Source

On June 9, 2014, the Callaway Plant was in Mode 1 operating at 100 percent rated thermal power when, during a maintenance activity, inverter NN11 unexpectedly transferred from its normal direct current (dc) source to its bypass alternating current (ac) source. This inverter provides power to the NN01 bus which is one of four vital 120 Vac instrument buses at the Callaway Plant. The transfer of inverter NN11 to its bypass source was caused by a momentary loss of power to bus SB038 which supports instrumentation and controls for systems such as the reactor trip system and the engineered safety feature actuation system. This momentary loss of power caused the following plant impacts:

- Control rod insertion 6½ steps, with an associated pressurizer level and pressure perturbation and subsequent Xenon transient
- Opening of valve BNLCV0112D, centrifugal charging pump A suction from refueling water storage tank isolation valve, due to momentary loss of the associated volume control tank level channel

- Actuation of the steam generator environmental allowance modifier circuit, resulting in resetting of the low level setpoint trip from 17 to 21 percent narrow range level
- Numerous momentary partial trip actuations

The NRC inspectors responded to the control room and verified that the plant systems responded as designed and that the operators stabilized the plant in accordance with plant procedures.

Investigation identified a loose mounting screw that secures disconnect switch NN01-11 to NN01. Maintenance work in the area of the loose termination led to a momentary interruption of power to cabinet SB038, which appeared as a fault condition to the inverter, thus causing the inverter to transfer to its alternate power source.

The cabinet, bus, and inverter are seismically qualified and are required to be capable of performing their design basis accident functions following a safe shutdown earthquake. With the degraded electrical termination, which existed for an extended period of time before discovery and repair, the inverter and SB038 loads would not have been capable of performing their design basis function following a safe shutdown earthquake, thus rendering the components inoperable.

The direct cause of this event was inadequate thread engagement of the screw securing disconnect switch NN01-11 to the NN01 bus. However, the presence of threads in the switch mounting hole (which is not intended to engage with the bus bar termination screw) introduced the potential for binding during screw installation. The detail of this mounting configuration is not identified on plant drawings of the cabinet or switch provided by the vendor and nothing in the work control process required a detailed comparison of the switch to the work procedures and, as such, it was reasonable that this potential vulnerability was not identified and addressed in the procedure or pre-job walkdown. During the actual installation of the screw, the screw appeared flush and tight with the switch mounting board, meeting the requirements of the work package. The equipment was successfully post-maintenance tested and technical specification surveillance tested for a period of 6 years. There was also no industry or vendor operating experience describing this vulnerability. Based on this information, the inspectors concluded that no performance deficiency existed since it was not reasonable for Callaway Plant personnel to foresee and correct this condition.

The licensee's root cause analysis determined that the root cause of the event was that work instructions did not include direction to remove the back panel cover of the cabinet to support alignment and thread engagement of the mounting screws during switch installation. Corrective actions taken by the licensee included changes to job planning aids and the maintenance procedures associated with the replacement of this type of switch.

The inspectors determined during their review of Licensee Event Report 2014-003-01 that traditional enforcement applies in accordance with Inspection Manual Chapter 0612, Appendix B, Figures 1 and 2, "Issue Screening," Inspection Manual Chapter 0612, Section 9, and NRC Enforcement Policy, Section 2.2.4.d, because a violation of NRC requirements existed without an associated Reactor Oversight Process performance deficiency. This issue is considered to be a Severity Level IV violation of 10 CFR

Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," based on a conservative bounding evaluation performed using Callaway's SPAR model which determined the condition was of very low safety significance (Green) and was similar in significance to NRC Enforcement Policy example 6.1.d.2. This issue was entered into Callaway Plant's corrective action program as Callaway Action Request 201403898.

Licensee Event Report 2014-003-01 was submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Callaway Technical Specification 3.8.7, "Inverters – Operating," based on the period of past inoperability of the NN11 inverter and SB038 loads. The inspectors reviewed the licensee's submittal and determined that the report included the potential safety consequences and necessary corrective actions, but it did not thoroughly document the event, in that the effects on the plant from the inverter transfer to its alternate ac power source were not described. The licensee entered the licensee event report completeness issue into their corrective action program as Callaway Action Request 201504217 and initiated a corrective action to submit a revision of the licensee event report at a later date.

Because it was not reasonable for the licensee to have been able to foresee and correct the condition that caused the switch failure, the NRC determined that no performance deficiency existed. Thus, the NRC is exercising enforcement discretion in accordance with Section 3.5 of the NRC Enforcement Policy and is not issuing enforcement action for the violation (EA-15-152). Further, because the licensee's action and/or inaction did not contribute to this violation, it will not be considered in the assessment process or the NRC's reactor oversight process action matrix. This licensee event report is closed.

These activities constitute completion of one event follow-up sample, as defined in Inspection Procedure 71153.

40A6 Meetings, Including Exit

Exit Meeting Summary

On March 30, 2015, the emergency preparedness inspectors discussed the in-office review of the preliminary scenario for the 2015 biennial exercise, submitted February 27, 2015, with Mr. P. McKenna, Manager, Emergency Preparedness, and other members of the licensee staff. The licensee acknowledged the issues presented.

On May 8, 2015, the emergency preparedness inspectors presented the inspection results to Mr. F. Diya, Senior Vice President and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On July 1, 2015, the inspectors discussed the inspection results with Mr. D. Neterer, Vice President, Nuclear Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On July 30, 2015, the inspectors presented the results of the enforcement discretion determination to Mr. B. Cox, Senior Director, Nuclear Operations. The licensee acknowledged the results presented.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Bianco, Director, Nuclear Operations
G. Bradley, Director, Engineering Systems
B. Cox, Senior Director, Nuclear Operations
F. Diya, Senior Vice President and Chief Nuclear Officer
R. Farnam, Director, Training
J. Geyer, Director, Radiation Protection
L. Graessle, Senior Director, Operations Support
D. Hall, Director, Engineering Programs
T. Herrmann, Vice President, Engineering
B. Jungmann, Director, Maintenance
J. Kovar, Licensing Engineer
G. Kremer, Director, Engineering
S. Maglio, Manager, Regulatory Affairs
P. McKenna, Manager, Emergency Preparedness
M. McLachlan, Senior Director, Engineering
V. Miller, Supervising Health Physicist, Radiation Protection
T. Moser, Director, Projects
D. Neterer, Vice President, Nuclear Operations
K. Wieth, Supervisor, Security

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2015002-01	NCV	Failure to Properly Implement Compensatory Actions as Directed by Procedure (Section 1R13)
05000483/2015002-02	NCV	Inadequate Operability Evaluation When Taking Emergency Diesel Generator Support Equipment Out of Service (Section 1R15)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OTO-ZZ-00012	Severe Weather	30
PDP-ZZ-00027	Summer Reliability Program	5

Callaway Action Requests

201502109 201502114 201408029

Jobs

14005481

Section 1R04: Equipment Alignment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OTN-GK-00001	Control Building HVAC System	43
OTN-GK-00001, Checklist 1	Control Building HVAC System Electrical Equipment Lineup	13
OTN-GK-00001, Checklist 2	Control Building HVAC System Normal Valve Lineup by Component	15
OTN-GK-00001, Checklist 3	Control Building HVAC System Switch Lineup	13
OTN-EN-00001	Containment Spray System	23
OTN-EN-00001, Checklist 1	Containment Spray System Electrical Equipment Lineup	10
OTN-EN-00001, Checklist 2	Containment Spray System Normal Valve Lineup	13
OTN-EN-00001, Checklist 3	Containment Spray System Main Control Board Lineup	10
OTN-AL-00001	Auxiliary Feedwater System	33
OTN-AL-00001, Checklist 1	Auxiliary Feedwater Valve Alignment	22
OTN-AL-00001, Checklist 2	MD-AFP A and B Switch Alignment	18

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22GK01	Piping and Instrumentation Diagram – Control Building HVAC	20
M-22GK02	Piping and Instrumentation Diagram – Control Building HVAC	19
M-22GK03	Piping and Instrumentation Diagram – Control Building HVAC	23

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22GK04	Piping and Instrumentation Diagram – Control Building HVAC	19
M-22EN01	Piping and Instrumentation Diagram – Containment Spray System	16
M-22AL01	Piping and Instrumentation Diagram – Auxiliary Feedwater System	44

Callaway Action Requests

201504199

Section 1R05: Fire Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
Fire Preplan Manual	Fire Pre-plan Manual	38
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	24
APA-ZZ-00701	Control of Fire Protection Impairments	21
FPP-ZZ-00007	Miscellaneous Buildings Inside Protected Area Prefire Strategies	14
OTO-KC-00001 ADD D-01	Diesel Generator Building 2000' – A Diesel Generator Room	0
OTO-KC-00001 ADD C-09	Control Building 2000' North ESF Switchgear Room	0
OTO-KC-00001 ADD C-10	Control Building 2000' South ESF Switchgear Room	0
SDP-KC-00001	Requirements and Duties of Compensatory Fire Watches	10

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
8600X89638	Yard Fire Loop – Fire Protection System Piping and Instrumentation Diagram	6
M-22KC02	FSAR Figure 9.5.1-1 Sheet 2 – Fire Protection System Piping and Instrumentation Diagram	22

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u> <u>Date</u>
23762	Fire Prevention Impairment Permit	0
KC-75	D-1 Detailed Fire Modeling Report	0
KC-87	Fire Safety Analysis for Fire Area A-7	1
KC-125	Fire Safety Analysis for Fire Area C-14	1
KC-149	Fire Safety Analysis for Fire Area D-1	1
2 nd Quarter 2015	May 18, 2015 Drill Plan and Authorization	May 18, 2015

Section 1R06: Flood Protection Measures

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
C-U203	Essential Service Water System Units 1&2 –Electrical Manholes –Plans, Sections & Details	8
E-UR0221	Raceway Plot Plan –Essential Service Water System – Plans & Sections	10

Jobs

14505836

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Photos of Manhole MH01B	June 5, 2014
	Photos and video of Manhole MH01B	June 4, 2015

Section 1R07: Heat Sink Performance

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ETP-ZZ-03010	Field Coatings (Non-Containment Building Coatings)	15
ETP-ZZ-03001	GL89-13 Heat Exchanger Inspection	9

Callaway Action Requests

200407638	200711241	200903177	201008312	201200466
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Callaway Action Requests

201308725	201503310	201503315
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Jobs

07010329	13513168
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
ARC 855	ARC Composite Technology ARC 855 Data Sheet	October 2006
810	Chesterton Polymer Composites 810 Steel Putty Plus Data Sheet	December 1991
RFR 006125A	Coating of Carbon Tube Sheets in Heat Exchangers	A

Section 1R11: Licensed Operator Requalification ProgramProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ODP-ZZ-00001	Operations Department – Code of Conduct	93
OSP-BB-00009	RCS Inventory Balance	37

Callaway Action Requests

201503583	201503609
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Dynamic Simulator Exam Scenario, DS-11	March 23, 2015
	Dynamic Simulator Exam Scenario, DS-12	April 1, 2015
	Operations Crew Watch Relief Turnover Checklists	June 18, 2015

Section 1R12: Maintenance EffectivenessProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EDP-ZZ-01128	Maintenance Rule Program	23

Callaway Action Requests

201500506	201407958	201110384	201402784
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Maintenance Rule Periodic Assessment for Cycle 20 (May 29, 2013 through November 22, 2014)	0

Section 1R13: Maintenance Risk Assessment and Emergent Work ControlsProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00750	Hazard Barrier Program	34
OTN-GK-00001	Control Building HVAC System	43
EDP-ZZ-01129	Callaway Energy Center Risk Assessment	44

Callaway Action Requests

201403041	201503241	201503501
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Jobs

13513168	13000678	15503379
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
NAI-1719-001	Callaway Control Building Loss of Class 1E A/C GOTHIC Room Heat Up Analysis	1
NAI-1719-001, Revision 1, Addendum 1	Control Building Analysis for Operability Evaluation	0
Standing Order	Actions for Inoperability of Class 1E A/C Unit	9

Section 1R15: Operability EvaluationsProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00500, Appendix 1	Operability and Functionality Determinations	23

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CSP-ZZ-07350	Diesel Fuel Oil Testing Program	25
CTP-JE-01230	Diesel Fuel Oil Sampling	48
ODP-ZZ-00001, Addendum 15	Operability and Functionality Determinations	8
OTS-JE-00001	Receipt and Handling of Diesel Fuel Oil	10

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
DAA-P-9788	Tornado Damper – Exhaust	C
E-23GM04A	Diesel Generator Building Exhaust Damper Schematic Diagram	1
J-22GM01B	Diesel Generator Building HVAC Exhaust Dampers Control Logic Diagram	0
M-22GM01	Diesel Generators Building HVAC Piping and Instrumentation Diagram	2
M-627A-00132	PASF-301 Pneumatic Actuator with Solenoid & Switchbox Dimensional Drawing	3

Callaway Action Requests

200509906	200603809	201204094	201404458	201502555
201502678	201502635	201404143	201504128	201502920
201503606				

Jobs

13000678	13000069	14005893	15500697	09511816
09511683				

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Callaway Control Room Log	April 15, 2015
18	Technical Specification Interpretation 18	11
10466-E-018	Technical Specification for Motor Control Centers for the Standardized Nuclear Unit Power Plant System (SNUPPS)	9

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
15415	Phoenix Chemical Laboratory, Inc. #2 Diesel Fuel Oil Sample Analysis Report	March 27, 2015
15415	Phoenix Chemical Laboratory, Inc. #2 Diesel Fuel Oil Sample Analysis Report, Corrected Report	April 13, 2015
ASTM D2500-11	Standard Test Method for Cloud Point of Petroleum Products	2011
RFR 9042A	D/G Ventilation System Tornado Dampers	July 3, 1991
RFR 19645A	Evaluate CEL Changes for GM System	A
GM-03	Emergency Diesel Generator Room Temperatures w/o HVAC	2
GM-03, Revision 2, Addendum 3	April Emergency Diesel Generator Room Temperatures without HVAC	0
M-627	Specification for Dampers	14
M-GM-02-C	Diesel Room Temperature Calculation	0
ZZ-179	Plant AC Load List Calculation	7
ZZ-179	Plant AC Load List Calculation	8
25400	Fire Protection Impairment Permit	0

Section 1R18: Plant ModificationsDrawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22GM01	Piping & Instrumentation Diagram – Diesel Generator Building HVAC	3

Jobs

13000678

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
MP-13-002	Replace EDG Supply Fans CGM01A and B	3

Section 1R19: Post-Maintenance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OSP-AL-P001B	Motor Driven Auxiliary Feedwater Pump B Inservice Test – Group A	58
OSP-AL-V001B	Train B Auxiliary Feedwater Valve Inservice Test	52
OSP-SA-0007B	Train B AFAS Slave Relay Test	32

Callaway Action Requests

201308726 201503381

Jobs

13513168	15001138	15501241	14502242	11506413
14502241	14502227	08004475	11505829	11506333
15501156	09511428	09511371	15501154	12511293
12500267	15501247	14502320	13000678	13513470
14501035	11501874	14501036	14501037	14501129
12501183	13006443	12503033	13512963	13501254
14513660				

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Vibration data for SGK05A	June 11, 2015

Section 1R22: Surveillance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CSP-ZZ-07600	Reactor Coolant System Activity Determinations	39
CSP-ZZ-07600, Addendum A	Reactor Coolant System Glass Sample Vessel and Sample Preparation	2
CSP-ZZ-07600, Addendum B	Reactor Coolant System INF Normal and Glass Sample Vessel Sampling	1
ISF-SB-0A33B	Solid State Protection System Train B Slave Relay K634 and K744 Test	23

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ISL-NF-NB02A	NB02 Degraded and Under Voltage to Load Shedding and Emergency Load Sequencing Channel I	26
ISL-NF-NB02B	NB02 Degraded and Under Voltage to Load Shedding and Emergency Load Sequencing Channel II	24
OSP-EJ-P001B	Residual Heat Removal Train B Inservice Test – Group A	58
OSP-GS-LL097	Containment Isolation Valve Leak Rate Test	10
OSP-GS-LLP97	Containment Isolation Valve Leak Rate Test	11
OSP-BB-00009	RCS Inventory Balance	37

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-23AB28	Main Steam Isolation Valves Control Schematic Diagram	10
E-23AB29	Main Steam Isolation Valves Control Schematic Diagram	7
7243D59-S024	Solid State Protection System Interconnection Diagram	8

Callaway Action Requests

200403965	200404837	201304234	201304201	201503693
201502664				

Jobs

15502407	15501185	15002311	13506951	15505777
13511572				

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E190.0074	Inservice Testing Program	32

Section 1EP7: Exercise Evaluation – Hostile Action Exercise Evaluation (71114.07)

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EIP-ZZ-00101	Classification of Emergencies	50, 51
EIP-ZZ-00101	Addendum 1, Emergency Action Level Classification Matrix	3

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EIP-ZZ-00101	Addendum 2, Emergency Action Level Basis Document	7, 8, 9
EIP-ZZ-00102	Emergency Implementing Actions	58
EIP-ZZ-00200	Augmentation of the Emergency Response Organization	18, 19, 20
EIP-ZZ-00201	Notifications	50
EIP-ZZ-00201	Notifications, Addendum A, Control Room Notification Flowchart	23
EIP-ZZ-00201	Notifications, Addendum C, EOF Notification Package	23
EIP-ZZ-00212	Protective Action Recommendations	26, 27
EIP-ZZ-00220	Emergency Team Formation	24
EIP-ZZ-00226	Fire Response Procedure for Callaway Plant	20
EIP-ZZ-00240	Technical Support Center Operations	40, 41, 42
EIP-ZZ-00240	Addendum A, Emergency Coordinator Checklist	6
EIP-ZZ-00240	Addendum H, Security Coordinator Actions	6
EIP-ZZ-C0010	Emergency Operations Facility Operations	37
EIP-ZZ-C0010	Addendum A, Recovery Manager Checklist	6
EIP-ZZ-C0010	Addendum B, Protective Measures Coordinator Checklist	8
EIP-ZZ-SK001	Response to Security Events	11
KDP-ZZ-02001	Drill and Exercise Program	17
KOA-ZZ-A0002	Command and Control Guidelines	5
KOA-ZZ-A0003	Processing of Offsite Responders during Emergencies	4
KOA-ZZ-A0004	Processing of Law Enforcement Responding during Emergencies	4
KOA-ZZ-ICP01	Incident Command Post Guidelines	February 23, 2015
OTO-SK-00001	Plant Security Event – Hostile Intrusion	25

Callaway Action Requests

201300664	201300722	201306009	201306358	201306551
201307458	201401781	201402303	201402752	201403220
201406670	201406783	201500262	201500269	201500548
201501309	201501539	201501702	201501710	201501738
201501757	201501781	201501983	201502421	201503233

Callaway Action Requests

201503254	201503283	201503285	201503286	201503287
201503289	201503290	201503291	210503296	201503297
201503298	201503299	201503301	201503302	201503303
201503304	201503305	201502206	201503307	201503308
201503309	201503322	201503325	201503329	201503254
201503302	201503376	201503378	201503399	201503400
201503518				

MiscellaneousTitle

Callaway Plant Radiological Emergency Response Plan

Section 40A1: Performance Indicator VerificationProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EIP-ZZ-00101	Classification of Emergencies	50, 51
EIP-ZZ-00101	Addendum 1, Emergency Action Level Classification Matrix	3
EIP-ZZ-00101	Addendum 2, Emergency Action Level Basis Document	7, 8, 9
EIP-ZZ-00201	Notifications	50
EIP-ZZ-00201	Notifications, Addendum A, Control Room Notification Flowchart	23
EIP-ZZ-00201	Notifications, Addendum C, EOF Notification Package	23
EIP-ZZ-00212	Protective Action Recommendations	26, 27
KDP-ZZ-02000	NRC Performance Indicator Data Collection	17
KSP-ZZ-00110	Siren Alerting System Testing	14
OSP-BB-00009	Reactor Coolant System Inventory Balance	37

Callaway Action Requests

201408530	201408399	201504211
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Reactor Coolant System Dose Equivalent I-131 Activity Data December 30, 2013 through January 2, 2015	
2014-005-00	Licensee Event Report – All Emergency Core Cooling System Accumulator Isolation Valve Operator Breakers Closed in Mode 3 with Reactor Coolant System Pressure Greater than 1000 PSIG	0
2014-003-01	Licensee Event Report – Inverter NN11 Inadvertently Transferred to its Alternate AC Source	1
	MSPI Basis Document	14
AL-04 Addendum 3	Auxiliary Feedwater System Fault Tree Model	1
AL-04 Addendum 11	Auxiliary Feedwater System Fault Tree Model	1

Section 40A2: Identification and Resolution of Problems

Callaway Action Requests

201407402 201501480

Jobs

13511363

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Callaway Action Requests

201407402 201501480

Jobs

08000950

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2014-003-01	Licensee Event Report – Inverter NN11 Inadvertently Transferred to its Alternate AC Source	1