



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 E. LAMAR BLVD.  
ARLINGTON, TX 76011-4511

November 8, 2016

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 05000483/2016003

Dear Mr. Diya,

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. On October 7 and October 19, 2016, the NRC inspectors discussed the results of this inspection with Mr. T. Herrmann, Site Vice President, and Mr. B. Cox, Senior Director, Nuclear Operations, respectively, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violation or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Callaway Plant.

F. Diya

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This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Nicholas H. Taylor, Branch Chief  
Project Branch B  
Division of Reactor Projects

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

Enclosure:  
Inspection Report 05000483/2016003  
w/ Attachment: Supplemental Information

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F. Diya

- 2 -

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Letter to Fadi Diya from Nicholas H. Taylor dated November 8, 2016

SUBJECT: CALLAWAY PLANT – NRC INTEGRATED INSPECTION  
REPORT 05000483/2016002

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000483

License: NPF-30

Report: 05000483/2016003

Licensee: Union Electric Company

Facility: Callaway Plant

Location: Junction Highway CC and Highway O  
Steedman, MO

Dates: July 1 through September 30, 2016

Inspectors: T. Hartman, Senior Resident Inspector  
M. Langelier, P.E., Resident Inspector  
J. Braisted, Reactor Inspector, Engineering Branch 1  
J. Drake, Senior Reactor Inspector, Engineering Branch 2  
S. Hedger, Operations Engineer  
B. Larson, Senior Operations Engineer

Approved By: Nicholas H. Taylor  
Chief, Project Branch B  
Division of Reactor Projects

## SUMMARY

IR 05000483/2016003; 07/01/2016 - 09/30/2016; Callaway Plant, Licensed Operator Requalification Program and Licensed Operator Performance

The inspection activities described in this report were performed between July 1 and September 30, 2016, by the resident inspectors at the Callaway Plant and inspectors from the NRC's Region IV office. One finding of very low safety significance (Green) is documented in this report. This finding 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 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. (Section 1R11)

## PLANT STATUS

Callaway began the inspection period at 100 percent power. On September 26, 2016, the licensee reduced power to approximately 65 percent power to address an issue with their digital feedwater control system. Callaway returned to 100 percent power on September 28, 2016, and stayed there for the remainder of the inspection period.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### Readiness for Impending Adverse Weather Conditions

##### a. Inspection Scope

On July 13, 2016, 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 severe thunderstorms, and the licensee's implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

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)

##### Partial Walk-Down

##### a. Inspection Scope

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

- August 17, 2016, train A safety injection system
- August 22, 2016, train A emergency exhaust system
- September 15, 2016, reactor coolant system pressurizer and pressurizer relief tank
- September 27, 2016, train B emergency diesel generator

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 four partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

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 five plant areas important to safety:

- August 3, 2016, auxiliary building 2047' general floor area (A-19)
- August 19, 2016, auxiliary building 2047' component cooling water surge tank area (A-20)
- September 10, 2016, train B electrical penetration room (A-17)
- September 10, 2016, train B control room air conditioning and filtration room (A-21)
- September 10, 2016, reactor trip switchgear room (A-27)

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 five quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

**1R06 Flood Protection Measures (71111.06)**

a. Inspection Scope

On September 19, 2016, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis,



the inspectors chose the emergency diesel generator building which contains risk-significant structures, systems, and components that were susceptible to flooding.

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

These activities constituted completion of one flood protection measures sample as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

**1R07 Heat Sink Performance (71111.07)**

a. Inspection Scope

The inspectors reviewed licensee programs to verify heat exchanger performance and operability for the following heat exchangers:

- ultimate heat sink
- component cooling water heat exchanger EEG01B
- containment cooler SGN01D
- class 1E electrical equipment A/C unit SGK05A

The inspectors verified whether testing, inspection, maintenance, and chemistry control programs are adequate to ensure proper heat transfer. The inspectors verified that the periodic testing and monitoring methods, as outlined in commitments to NRC Generic Letter 89-13, utilized proper industry heat exchanger guidance. Additionally, the inspectors verified that the licensee's chemistry program ensured that biological fouling was properly controlled between tests. The inspectors reviewed previous maintenance records of the heat exchangers to verify that the licensee's heat exchanger inspections adequately addressed structural integrity and cleanliness of their tubes.

These activities constitute completion of four triennial heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

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 August 16, 2016, the inspectors observed a portion of an annual requalification test for Crew 1 licensed operators. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed and the modeling and performance of the simulator during the requalification activities.

These activities constituted 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. At the time of the observations, the plant was in a period of heightened activity. The inspectors observed the operators' performance of the following activities:

- August 26, 2016, shift turnover and annunciator response
- September 2, 2016, reactor trip breaker trip actuation device operational testing

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

#### **b. Findings**

No findings were identified.

### **.3 Annual Review**

#### **a. Inspection Scope**

The inspectors conducted an in-office review of the annual requalification training program to determine the results of this program.

On August 24, 2016, the licensee informed the inspectors of the following Callaway Plant operating test results:

- 8 of 9 crews passed the simulator portion of the operating test
- 51 of 51 licensed operators passed the simulator portion of the operating test
- 50 of 51 licensed operators passed the job performance measure portion of the operating test

The individual that failed the job performance measure portion of the operating test has been remediated and passed a subsequent test.

The inspectors completed one inspection sample of the annual licensed operator requalification program.

Using the same inspection procedure, the inspectors completed evaluation of a simulator fidelity issue where review started during last year's biennial licensed operator requalification program inspection (Inspection Report 05000483/2015003, Adams Accession Number ML15306A580).

b. Findings

Introduction. 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 design input provided by the vendor on how long the control rod motor generator sets would keep control rod drive mechanisms energized after input breakers were open, the simulator kept the control rods withdrawn out of the core for maximum case of approximately two minutes longer than they would be if operator action had been taken to open the motor generator set input breakers in response to an anticipated transient without scram event. The licensee documented their corrective actions for this issue in Condition Report 201503621.

Description. During the December 2014 initial licensing examination, one of the scenarios involved a main feedwater pump trip at approximately 95 percent power, with a failure of the reactor to trip, known as an anticipated transient without scram. During the event, NRC examiners observed that a low pressurizer pressure safety injection signal was received within three minutes of the initiation of the anticipated transient without scram. The safety injection actuation signal set points are established to protect the reactor fuel and cladding during loss of coolant and steam line break accidents. Since the simulated event should not have caused a safety injection actuation within this short time frame, NRC examiners questioned the licensee as to why this safety injection actuation occurred for the specified conditions. NRC examiners documented this issue in Examination Report 05000483/2014301 (Adams Accession Number ML15021A562), and the licensee began their evaluation. The evaluation involved comparison of simulator performance versus available plant design data, input from plant vendors, and comparison to similarly designed plants in the country. The status of the evaluation was reviewed by NRC inspectors during the September 2015 biennial licensed operator requalification program inspection. At that time, the licensee was still assessing

applicable information in consultation with the plant vendor. It was determined that the review would take longer than the time allotted for the inspection activity. NRC Inspection Report 05000483/2015003 documented that the simulator anticipated transient without scram with subsequent safety injection event review would not be completed until the licensee provided all of the evaluation's results.

On May 18, 2016, licensee staff provided NRC inspectors the results of the evaluation. Simulator testing documentation showing the results of modeling changes dated June 30, 2016, were provided as part of the subsequent dialogue. Review of the evaluation results concluded on July 8, 2016. The evaluation revealed that there was a difference in how the simulator modeled the time it took for the control rods to drop into the core after the control rod motor generator input breakers were opened when compared to plant vendor information. In 2014, the simulator was modeled to take two minutes for the rods to fully insert into the core once the motor generator input breakers were opened. It was determined that the licensee had set the time to two minutes in all cases in 1985. However, in 1989 Westinghouse answered the question of how long it should take for the control rods to insert into the core when the control rod motor generator input breakers were opened in document DW-88-004. It states, in part, "[a]ctual plant experience demonstrates that this time delay will vary from several seconds to one minute." If operators were taking action to manually insert the control rods while the motor generator sets were coasting down, it would take several seconds for all of the control rods to drop into the core. If there was no operator action during the coast down period, the time would be on the order of a minute. There was no evidence of a licensee review of the vendor documentation made available on this topic in 1989.

Information provided to the NRC indicates the licensee implemented action to change the simulator model so that control rods will be inserted in the core during the recommended timeframes. The changes in simulator modeling were based on recent licensee discussions with Westinghouse and similarly designed plants. Follow-on simulator testing with a scenario similar to that used in the 2014 initial licensing examination showed that no safety injection signal was generated during the transient.

Analysis. The failure of the licensee's simulator staff to ensure that the plant-referenced simulator demonstrated expected plant response to transient and accident conditions for which the simulator 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, Attachment 4, "Initial Characterization of Findings," 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 the simulator fidelity deficiency did not negatively impact operator performance in the actual plant during a reportable event.

This finding has no cross-cutting aspect assigned because the cause is not reflective of current licensee performance. The annual review process of similar documentation by the licensee's emergency operating procedure steering committee in place today would likely have prevented the omission of an appropriate evaluation of owners' group documentation for simulator fidelity information.

Enforcement. Title 10 CFR 50.46 (c), "Plant-Referenced Simulators," requires, in part, that plant-referenced simulators demonstrate expected plant response to transient and accident conditions to which the simulators have been designed to respond. Contrary to the above, from March 2, 1989, through June 30, 2016, the licensee failed to ensure that its plant-referenced simulator demonstrated expected plant response to transient and accident conditions to which it was designed to respond. Specifically, the simulator failed to model the response of the control rods after control rod motor generator input breakers were opened as prescribed by the vendor. This had the potential to cause negative operator training in the simulator. Because this finding is of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report 201503621, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC's Enforcement Policy. NCV 05000483/2016003-01, "Failure to Maintain Simulator Fidelity."

## **1R12 Maintenance Effectiveness (71111.12)**

### **a. Inspection Scope**

The inspectors reviewed three instances of degraded performance or condition of safety-related structures, systems, and components:

- June 6, 2016, essential service water system after water hammer event
- June 18, 2016, train B control room air conditioning unit loose bolts and compressor damage
- June 28, 2016, nitrogen service gas system, water infiltration into system and failure of electrical penetration to train A residual heat removal containment sump suction isolation valve

The inspectors reviewed the extent of condition of possible common cause structure, system, and component failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the structures, systems and components. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of three maintenance effectiveness samples, 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**

On August 23, 2016, the inspectors reviewed risk assessments performed by the licensee for work on the emergency exhaust system. The inspectors also reviewed the risk management actions taken by the licensee in response to the elevated risk.

The inspectors reviewed the risk assessments to evaluate if they 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 assessment and reviewed the risk management actions implemented based on the result of the assessment to evaluate if they were appropriate.

The inspectors also observed portions of four emergent work activities that had the potential to cause an initiating event, or to affect the functional capability of mitigating systems:

- July 28, 2016, train B emergency diesel generator 14 cylinder fuel injector pump stuck open
- August 8, 2016, PJ31 failed while placing in service
- September 19, 2016, train A containment spray pump room cooler replacement
- September 27, 2016, train B main feedpump removed from service for digital feedwater control issues

The inspectors verified that the licensee appropriately developed and followed a work plan 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 constituted completion of five maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

### **b. Findings**

No findings were identified.

## **1R15 Operability Determinations and Functionality Assessments (71111.15)**

### **a. Inspection Scope**

The inspectors reviewed three operability determinations and functionality assessments that the licensee performed for degraded or non-conforming structures, systems, or components:

- August 24, 2016, functionality determination of the fire protection system
- August 25, 2016, functionality determination of class 1E switchgear air conditioning units

- September 7, 2016, operability determination of train A containment spray pump

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

On September 30, 2016, the inspectors reviewed operator actions taken or planned to compensate for degraded or non-conforming conditions. The inspectors verified that the licensee effectively managed these operator workarounds to prevent adverse effects on the function of mitigating systems and to minimize their impact on the operators' ability to implement abnormal and emergency operating procedures.

These activities constituted completion of three operability and functionality review samples and one operator work-around sample, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

**1R18 Plant Modifications (71111.18)**

a. Inspection Scope

The inspectors reviewed two permanent plant modifications that affected risk-significant structures, systems, and components:

- June 28, 2016, modification of the service gas nitrogen supply piping to the containment electrical penetrations to prevent water intrusion (Modification Package 16-0014)
- July 8, 2016, modification of existing 2-pole potential test switch in NB0101 and NB0201 cubicles (Modification Package 01-1012)

The inspectors reviewed the design and implementation of the modifications. The inspectors verified that work activities involved in implementing the modifications 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 operability or functionality of the structures, systems, and components as modified.

These activities constituted completion of two samples 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 five post-maintenance testing activities that affected risk-significant structures, systems, or components:

- August 30, 2016, turbine-driven auxiliary feedwater pump speed sensor replacement
- September 10, 2016, train A class 1E room chiller repairs
- September 14, 2016, train A containment spray room cooler replacement
- September 22, 2016, train B class 1E room chiller planned maintenance
- September 28, 2016, train A emergency diesel generator planned maintenance

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, systems, or components.

These activities constituted completion of five 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 three 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:

- September 7, 2016, inservice testing of train A essential service water from containment air coolers bypass isolation valve

Other surveillance tests:

- September 15, 2016, load shed and emergency load sequencing channel calibration
- September 19, 2016, train B containment isolation signal – phase A slave relay 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 constituted completion of three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

**1EP6 Drill Evaluation (71114.06)**

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on September 1, 2016, 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 Technical Support Center, 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 constituted completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

.2 Training Evolution Observation

a. Inspection Scope

On August 16, 2016, the inspectors observed annual simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. 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 evaluators and entered into the corrective action program for resolution.

These activities constituted completion of one training observation sample, as defined in Inspection Procedure 71114.06.

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 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors reviewed licensee event reports for the period of third quarter 2015 through second quarter 2016 to determine the number of scrams that occurred. The inspectors compared the number of scrams reported in these licensee event reports to the number reported for the performance indicator. Additionally, the inspectors sampled monthly operating logs to verify the number of critical hours during the period. 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 data reported.

These activities constituted verification of the unplanned scrams per 7000 critical hours performance indicator for Callaway Plant, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors reviewed operating logs and corrective action program records for the period of third quarter 2015 through second quarter 2016 to determine the number of unplanned power changes that occurred. The inspectors compared the number of unplanned power changes documented to the number reported for the performance indicator. Additionally, the inspectors sampled monthly operating logs to verify the number of critical hours during the period. 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 data reported.

These activities constituted verification of the unplanned power outages per 7000 critical hours performance indicator for Callaway Plant, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors reviewed the licensee's basis for including or excluding in this performance indicator each scram that occurred between third quarter 2015 and second quarter 2016. 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 data reported.

These activities constituted verification of the unplanned scrams with complications performance indicator for Callaway Plant, 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 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected two issues for an in-depth follow-up:

- On March 9, 2016, the train B emergency diesel generator experienced a rapid load decrease from 4 MW to 2.5 MW unexpectedly during surveillance testing. This was entered into Callaway's corrective action program as Condition Report 201602074. The cause was determined to be an issue with the

governor's digital reference unit, which was subsequently replaced to correct the issue.

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

- On June 10, 2016, the high energy line break barriers (doors) in the auxiliary feedwater pump area were not controlled as required by procedure. This was entered into Callaway's corrective action program as Condition Report 201605515.

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

These activities constituted completion of two annual follow-up samples as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

#### **4OA6 Meetings, Including Exit**

##### Exit Meeting Summary

On September 8, 2016, the inspectors presented the annual requalification training inspection results to Mr. B. Farnam, Director, Training, 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 September 29, 2016, the inspectors presented the triennial heat exchanger inspection results to Mr. B. Cox, Senior Director, Nuclear Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On October 7, 2016, the inspectors presented the inspection results to Mr. T. Herrmann, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors has been or will be returned or destroyed.

On October 19, 2016, the inspectors presented updated inspection results to Mr. B. Cox, Senior Director, 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 has been or will be returned or destroyed.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

A. Alley, Supervisor, Program Engineering  
R. Andreasen, Design Engineer  
J. Cordz, Safety Analysis Engineer  
B. Cox, Senior Director, Nuclear Operations  
L. Eitel, Supervisor, Engineering Systems  
T. Elwood, Supervising Engineer, Regulatory Affairs/Licensing  
B. Farnam, Director, Training  
M. Hoehn II, Supervisor, Engineering Programs  
T. Herrmann, Site Vice President  
R. Hughey, Manager, Shift Operations  
E. Keene, Senior Training Supervisor, Emergency Preparedness  
S. Kovalski, Director, Engineering Design  
S. McLaughlin, Manager, Performance Improvement  
T. Parashar, System Engineer  
S. Petzel, Engineer, Regulatory Affairs  
J. Stollhans, Program Engineer  
R. Tiefenauer, Senior Training Supervisor, Licensed Operator Requalification  
K. Tipton, Supervisor, Engineering Systems  
D. Turley, Supervisor, Engineering Systems  
R. Wink, Manager, Regulatory Affairs  
T. Witt, Engineer, Regulatory Affairs  
C. Wood, Program Engineer

### **LIST OF ITEMS OPENED AND CLOSED**

#### **Opened and Closed**

05000483/2016003-01    NCV    Failure to Maintain Simulator Fidelity (Section 1R11)

### **LIST OF DOCUMENTS REVIEWED**

#### **Section 1R01: Adverse Weather Protection**

##### **Procedures**

<b><u>Number</u></b>	<b><u>Title</u></b>	<b><u>Revision</u></b>
OTO-ZZ-00012	Severe Weather	33

## Section 1R04: Equipment Alignment

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CTP-BB-06300	RCS Forced Oxidation	0
ODP-ZZ-00002	Equipment Status Control	84
OTN-BG-00004, Addendum 5	VCT – Chemical Degasification	11
OTN-EM-00001	Safety Injection System	37
OTN-GG-00001	Fuel Building HVAC System	30
OTN-GG-00001, Checklist 1	Fuel Handling Building HVAC System Valve and Damper Lineup	15
OTN-GG-00001, Checklist 2	Fuel Handling Building HVAC System Breaker Lineup	13
OTN-GG-00001, Checklist 3	Fuel Handling Building HVAC System Switch Lineup	13
OTN-NE-0001B	Standby Diesel Generation System – Train B	52
OTN-NE-0001B, Checklist 1	Standby Diesel Generator ‘B’ System Valve Alignment	16
OTN-NE-0001B, Checklist 2	Standby Diesel Generator ‘B’ Fuel Oil System Valve Alignment	14
OTN-NE-0001B, Checklist 5	Standby Diesel Generator ‘B’ Instrument Valve Alignment	14
OTN-NE-0001B, Checklist 7	Diesel Generator ‘B’ D/P Root Valve Lineup	14

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22EM01(Q)	High Pressure Coolant Injection System Piping and Instrumentation Diagram	38
M-22GG01(Q)	Fuel Building HVAC Piping and Instrumentation Diagram	16
M-22GG02(Q)	Fuel Building HVAC Piping and Instrumentation Diagram	13
M-22BB01(Q)	Reactor Coolant System Piping and Instrumentation Diagram	31
M-22BB01(Q)	Reactor Coolant System Piping and Instrumentation Diagram	33

### Condition Reports

200801549	201407000	201407402	201407613	201606761
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Jobs

10515027

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Inservice Testing Program	32
M-621-00035A	IM Air-Cleaning Devices (Seismic)	5
RFR 15642A&B	Chemical Degas RCS System on Plant Shutdown	A & B
677457	Westinghouse Equipment Specification 677457	0
5525	Westinghouse Change Control No. 5525	0

**Section 1R05: Fire Protection**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	26
APA-ZZ-00741	Control of Combustible Materials	28
APA-ZZ-00750	Hazard Barrier Program	37
OTO-KC-00001, Add A-17	Auxiliary Building 2026' – South Electrical Penetration Room	0
OTO-KC-00001, Add A-19	Auxiliary Building 2047' – General Floor Area	0
OTO-KC-00001, Add A-21	Auxiliary Building 2047' – Control Room A/C and Filtration Units Room 'B'	0
OTO-KC-00001, Add A-27	Auxiliary Building 2026' – Rod Drive MG Set Room	0

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
A-2804	Architectural Fire Delineation Floor Plan, EI 2047'-6"	27

Jobs

16003536

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Fire Preplan Manual	38
KC-26	Nuclear Safety Capability Assessment	1
KC-54	A-19 Detailed Fire Modeling Report	0
KC-97	Fire Safety Analysis Calculation for Fire Area A-17	1
KC-99	Fire Safety Analysis Calculation for Fire Area A-19	1
KC-100	Fire Safety Analysis Calculation for Fire Area A-20	1
KC-101	Fire Safety Analysis Calculation for Fire Area A-21	1
KC-107	Fire Safety Analysis Calculation for Fire Area A-27	1
RFR 13528A	Evaluate Storage of Equipment in Auxiliary Building	A
RFR 8191B	Securing of Hoists in Seismic Category 1 Buildings	B

**Section 1R06: Flood Protection Measures**Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22KC02(Q)	Fire Protection System Piping and Instrumentation Diagram	23
M-22KJ04(Q)	Standby Diesel Generator "B" Cooling Water System Piping and Instrumentation Diagram	24
M-22EF01(Q)	Essential Service Water System Piping and Instrumentation Diagram	79
M-22AN01(Q)	Demineralized Water Storage and Transfer System Piping and Instrumentation Diagram	43
M-29AN09	Hanger Locations Small Pipes Demin. Water Stg. & Trans System Radwaste & Diesel Gens. Bldgs.	9
M-23AN09	Small Piping Isometric Demin. Water Stg. & Trans. System Radwaste & Diesel Gens. Bldgs.	5
M-29KJ03(Q)	Hanger Location Drawing Small Pipe Standby Diesel System Lube Oil & Jacket Water	5

Condition Reports

201105608	201305063
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### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-FL-10	Maximum Flood Level for Rooms in the Diesel Generator Building	2

### **Section 1R07: Heat Sink Performance**

#### Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EF-123	UHS Thermal Performance Analysis using GOTHIC 7.2(b) CAR #201001813	1
EF-45	Acceptance Criteria Used in Essential Service Water Flow Balance Procedures	8
EG-42	Determine the Recommended Maximum Number of Tubes that can be Plugged for the Component Cooling Water Heat Exchangers, EEG01A & EEG01B	0
GK-17	Determination of Allowable Number of Plugged Condenser Tubes in SGK04 and 5	0
GN-16	Containment Cooler Minimum Wall Calculation	0
M-EF-52	Heat Exchanger Performance Based on Reduced ESW Temperature and Flow	1
M-EF-52 Addendum 3	Heat Exchanger Performance Based on Reduced ESW Temperatures and Flows for Replaced Cooling Coils (Addendum 3 to Callaway Calculation M-EF-52)	0
M-EG-20	Maximum CCW Temperature during Post-LOCA	0
S-U-29-08	UHS Pond Seepage Analysis	0

#### Thermal Performance Analyses

<u>Number</u>	<u>Title</u>	<u>Revision</u>
10-042	Callaway Nuclear Plant Containment Fan Coil Unit, SGN01D, Thermal Performance Test Report	A
11-171	October 2011 Thermal Performance Test Data Evaluation and Uncertainty Analysis for CCW Heat Exchanger EEG01B	0
13-274	April 2013 Thermal Performance Test Data Evaluation and Uncertainty Analysis for CCW Heat Exchanger EEG01B	0
14-103	Callaway Nuclear Plant Containment Fan Coil Unit SGN01D June 2014 Thermal Performance Test Report	0
16-062	April 2016 Thermal Performance Test Data Evaluation and Uncertainty Analysis for CCW Heat Exchanger EEG01B	0

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Heat Exchanger Program Health Report	2 <sup>nd</sup> Quarter 2016
	Final Eddy Current Inspection Report for: Component Cooling Water Heat Exchanger (EEG01B)	April 18, 2016
	Final Eddy Current Inspection Report for: A Class IE Electrical Equipment AC Unit (SGK05A)	June 10, 2015
10466-M-072	Design Specification for Component Cooling Water Heat Exchangers for the Standardized Nuclear Unit Power Plant System (SNUPPS)	7
10466M-622.1	Design Specification for Packaged Air Conditioning Units for the Standardized Nuclear Unit Power Plant System (SNUPPS)	8
201300024-10	Raw Water Formal Self-Assessment Report	January 3, 2014
M-1179-00006	Air Cooled Heat Exchanger Specification Sheet Aerofin Engineering	0
PD041150.02	Record of Eddy Current Inspection of Component Cooling Water (CCW) Heat Exchanger – B at Ameren - Union Electric's Callaway Nuclear Plant Fulton, Missouri	April 2010

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22EG02	Piping and Instrumentation Diagram Component Cooling Water System FSAR Figure 9.2-3 Sheet 2	22
M-22GN01	Pipint and Instrumentation Diagram Containment Cooling System FSAR Figure 9.4-6 Sheet 1	26

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00395	Significant Operator Response Timing	26
CTP-EF-06105	Algae Treatment of the UHS Pond	8
E-1	Loss of Reactor or Secondary Coolant	18
EDP-EF-UHS01	UHS Cooling Tower Operational Guidance Following a LOCA	4
EDP-ZZ-00018	Heat Exchanger Eddy Current Testing Methodology	3
EDP-ZZ-01112	Heat Exchanger Predictive Performance Manual	20

## Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EIP-ZZ-00240 Addendum B	Technical Assessment Coordinator (TAC) Checklist	13
EOP Addendum 40	UHS Cooling Tower Fan Speed and Bypass Valve Control	0
ESP-EF-03002	Ultimate Heat Sink Retention Pond In-Service Inspection	6
ETP-EG-00004	Thermal Performance Test of the 'B' CCW Heat Exchanger	0
OOA-EF-00001	Ultimate Heat Sink Setpoint Levels	13
OSP-EF-0002A	Essential Service Water Train A Flow Verification	6
OSP-EF-V001A	ESW Train A Valve Operability	45
OTO-EG-00001	CCW System Malfunction	14

## Condition Reports (Issued)

201607944

## Condition Reports (Reviewed)

201300905	201407476	201602658	201603472	201607833	201307848
201602658	201505499	201501924	201009024	201504199	201308592
201308725	201309341	201403902	201403524	201404740	201405960
201503381	201504859	201504891	201506872	201504891	201506971
201603819	201604280				

## Jobs

14512059	10508093	10511510	12501183	11504347	11505070
10513289	05507294	08507248	13503839	14503313	15503262
11509170	13509748	14508027	13503837	14503308	15503260
14512926	14512769	13512536	13511959		

## Requests for Resolution

200700441	201002701	201107920
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## Section 1R11: Licensed Operator Requalification Program

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00103	EOP Program Procedure	15
ODP-ZZ-00001	Operations Department – Code of Conduct	99
ODP-ZZ-00003	Shift Relief and Turnover	36
OSP-SB-0001A	Reactor Trip Breaker 'A' Trip Actuating Device Operational Test	23
OTA-RK-00016, ADD29F	Annunciator Ground Fault	2

### Condition Reports

201101255	201503621	201607055	201607462
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### Jobs

16003609

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
DS-25	Dynamic Simulator Exam Scenario	August 6, 2016
DW-88-004	Direct Work Request Form, Affected Guidelines: E-0 FR-S.1, Operations Subcommittee Comment or Question, Telephone Submission Date: 2/10/1998	March 2, 1989
SIFT # 20110018	Verify Correct Values of Key Primary/Secondary Components	October 28, 2015
SIFT # 20150040	Simulation of MG Set Flywheel Coast Down on Loss of Power	June 5, 2015
SIFT # 20160016	Rod Drive MG Set Coastdown Time Change	June 30, 2016

## Section 1R12: Maintenance Effectiveness

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00500, Appendix 4	Transient Evaluation (TRAN)	2
EDP-ZZ-01128	Maintenance Rule Program	24

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00500, Appendix 4	Transient Evaluation (TRAN)	2
EDP-ZZ-01128, Appendix 1	SSCs in Scope of the Maintenance Rule at Callaway	10
EDP-ZZ-01128, Appendix 4	Maintenance Rule System Functions	16
ETP-ZZ-ST030	Simulate B train ESW Response to Loss of Offsite Power	1
EDP-ZZ-01007	Mechanical Snubber Program	29
QSP-ZZ-65044	Mechanical Snubber Visual and Transient Event Inspection	13

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22AF03	Feedwater Heater Extraction Drains and Vents	20
M-22FB01	Auxiliary Steam System Piping and Instrumentation Diagram	20
M-22KH01	Service Gas System Piping and Instrumentation Diagram	31

### Condition Reports

201007040	201603598	201605725	201605766	201605408
201604071	201605522			

### Jobs

04502015	05508657	06524756	08505186	10508550
11504345	16001349	FU031999	P516594	P533667
P552478	P584913	P621365	P656835	P692583
PM0811004	W172790	W175572	W177476	W661930
16003530	16003532	16003488	16003529	16003533
16003531	16003534			

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
ULNRC-219	Response to Nuclear Regulatory Commission IE Bulletin No. 77-07	January 17, 1978

## Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00322, Appendix B	Work Week Schedule and Execution	50
ODP-ZZ-00002, Appendix 1	Protected Equipment Program	24
ODP-ZZ-00002, Appendix 2	Risk Management Actions for Planned Risk Significant Activities	11
OTN-PJ-00001	Non-Class 1E 250VDC Electrical System	5

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E21-NG02	Low Voltage System Class 1E 480 V Single Line Meter & Relay Diagram	32
E-21PJ01	250 Volt DC System Meter & Relay Diagram Non-Class 1E Power System	4

### Condition Reports

201606788	201607203	201607352	201606547	201606579
201606595	201606598	201607352		

### Jobs

11005917	16004214	16509428	15501461	PM1000584
16004063	16004734	16005217		

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Field Supervisor Watch Relief Checklist	July 9, 2013
	Field Supervisor Watch Relief Checklist	June 17, 2014
	Field Supervisor Watch Relief Checklist	July 20, 2015

## Section 1R15: Operability Evaluations

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00500, Appendix 1	Operability and Functionality Determinations	25
ODP-ZZ-00001, Addendum 15	Operability and Functionality Determinations	9
ODP-ZZ-00001, Addendum 12	Operator Burdens and Workarounds	8

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22EN01(Q)	Containment Spray System Piping and Instrumentation Diagram	16

### Condition Reports

201606545	201606579	201606595	201606598	201606865
201606908	201607149	201607542	201607378	201606547

### Jobs

16004734	13006123
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### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
	Operations Narrative Logs	August 24, 2016
10466-M-088	Design Specification for Containment Spray Pumps for the Standardized Nuclear Unit Power Plant System (SNUPPS)	10
10466-E-029	Technical Specification for 5,000 Volt and 15,000 Volt Single-Conductor Power Cable for the Standardized Nuclear Unit Power Plant System (SNUPPS)	9
10466-J-515A	Technical Specification for Seismic Pressure Gauges for the Standardized Nuclear Unit Power Plant System (SNUPPS)	5
NAI-1942-001	Callaway ECCS and Containment Spray Room GOTHIC Model Development	0

## Section 1R18: Plant Modifications

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00322, Appendix C	Job Planning	43
EDP-ZZ-04015	Evaluating and Processing Requests for Resolution (RFR)	70
ISL-NF-NB01A	NB01 Degraded & UV to LSELS Channel 1	29
ISP-ZZ-LL3EP	Containment Electrical Penetration Leak Rate Test (Encapsulated Penetrations)	7

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-21NB01(Q)	Lower Medium Voltage System Class 1E 4.16 kV Single Line Meter and Relay Diagram	9
E-21NB02(Q)	Lower Medium Voltage System Class 1E 4.16 kV Single Line Meter and Relay Diagram	14
E-23NB01(Q)	Lower Medium Voltage System Class 1E 4.16 kV Three Line Meter and Relay Diagram	8
E-23NB04(Q)	Lower Medium Voltage System Class 1E 4.16 kV Three Line Meter and Relay Diagram	7
M-22KH01	Service Gas System Piping and Instrumentation Diagram	31

### Condition Reports

201603598	201603756	201603937
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### Jobs

16002102

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	50.59 Screen for MP 16-0014 Modify KH Piping to Prevent Water Intrusion to Electrical Penetrations	0
E-035-00122	IM Electrical Penetration Assemblies	13
Health Issue 2005063	EDG and Offsite Sources Inoperable during the Performance of I&C Surveillances	0
MP 01-1012	Installation of a Test Switch in NB0101 and NB0201	0



Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
MP 16-0014	Modify KH Piping to Prevent Water Intrusion to Electrical Penetrations	0
RFR 5389A	Evaluation of Procedure OTN-KH-0001	A
RFR 5389B	Evaluation of Potential Adverse Interaction of N <sub>2</sub> System w/EPAs	B
RFR 021055A	Revise Wiring and Fusing in NB01&02 for Sync Relay	A
10466-E-035	Technical Specification for Electrical Penetration Assemblies for the Standardized Nuclear Unit Power Plant System (SNUPPS)	8

**Section 1R19: Post-Maintenance Testing**Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OSP-AL-P0002	Turbine Driven Aux Feedwater Pump Inservice Test – Group B	77
OSP-EF-0002A	Essential Service Water Train A Flow Verification	6
QCP-ZZ-05041	Visual Examination to ASME VT-2	29

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-23EF02(Q)	Piping Isometric Essential Service Water Sys Aux. Bldg. "A" Train Supply	33
M-23EF03(Q)	Piping Isometric Essential Service Water Sys Aux. Bldg. "A" Train Return	33
M-23GK01A	Vent & Drain Details Carrier Room Cooler Coils & Aerofin Replacement Cooler Coils Aux Building	0

Condition Reports

201606957	201607585	201607592
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Jobs

10008811	10008816	10504869	10507397	12507771
12509336	13006123	13511885	13511901	13511915
13512095	14001601	14002301	14002302	15000489

Jobs

15004321	15504630	15504878	15005056	155002730
15502773	15502775	15502873	15505832	15505971
16002728	16003115	16004359		

**Section 1R22: Surveillance Testing**Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00100	Written Instructions Use and Adherence	34
ISL-NF-NB02A	NB02 Degraded & UV to LSELS Channel 1	27
ISL-NF-NB02B	NB02 Degraded & UV to LSELS Channel 2	25
ISL-NF-NB02C	NB02 Degraded & UV to LSELS Channel 3	24
ISL-NF-NB02D	NB02 Degraded & UV to LSELS Channel 4	30
ISP-NF-00002	Loop Misc; NF039B Relay Driver Test	8
OSP-EF-V001A	ESW Train A Valve Operability	45
OSP-SA-0009B	Train B CISA Relay Test	19

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-22EF02(Q)	Essential Service Water System Piping and Instrumentation Diagram	75

Condition Reports

201607523	201607528
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Jobs

16004705	16510100	16510101	16510104	16510105
16510108	16508179			

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Inservice Testing Program	32

## Section 1EP6: Drill Evaluation

### Condition Reports

201602989      201607162

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
20160901_001	September 2016 RERP Drill	August 25, 2016
	Radiological Emergency Response Plan (RERP)	47
DS-25	Dynamic Simulator Exam Scenario	August 6, 2016

## Section 4OA1: Performance Indicator Verification

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
2015-001-00	Licensee Event Report – Completion of Shutdown Required by Technical Specifications – TS 3.4.13	September 17, 2015
2015-003-01	Licensee Event Report – Reactor Trip Caused by Transmission Line Fault	January 21, 2016

## Section 4OA2: Identification and Resolution of Problems

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
APA-ZZ-00750	Hazard Barrier Program	37
SDP-PI-AR/RO	Armed Responder/Patrol Officer	24

### Condition Reports

201602074      201605515

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN 45335	Event Notice for Part 21 Involving Woodward Governors Using Unapproved Integrated Circuits	0
PO 240971	Material Receipt Inspection Report for Return Fairbanks Morse P/N 12998236/Woodward P/N 9903-439 SE	0
1000402-FA	Failure Analysis for Woodward 2301A & DRU 2301A LSSC P/N 9903-337 S/N 14704070 DRU P/N 9903-439 S/N 13445722	0

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
10CFR21-0088	10CFR21 Reporting of Defects and Non-Compliance – Engine Systems, Inc. Report No. 10CFR-21-0088, Rev. 0 Woodward DRU Controls	0
10CFR21-0091	10CFR21 Reporting of Defects and Non-Compliance – Engine Systems, Inc. Report No. 10CFR21-0091, Rev. 0 Woodward DRU Controls (Manufactured between November 2000 & November 2005) P/N: 9903-364, 9903-365, 9903-439, and 9903-470	0