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

April 26, 2017

EA-17-050

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 05000483/2017001, INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION REPORT 07201045/2017001, AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Diya,

On March 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. On March 29, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

No NRC-identified or self-revealed findings were identified during this inspection.

A violation of the licensee's current site-specific licensing basis for tornado-generated missile protection was identified. Because this violation was identified during the discretion period covered by Enforcement Guidance Memorandum 15-002, "Enforcement Discretion for Tornado Missile Protection Noncompliance," and because the licensee is implementing compensatory measures, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and allowing continued reactor operation.

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/***

David L. Proulx, Acting Branch Chief
Project Branch B
Division of Reactor Projects

Docket Nos. 05000483 and 07201045
License No. NPF-30

Enclosures:
Inspection Report 05000483/2017001
and 70201045/2017001,
w/Attachments:
1: Supplemental Information
2. Attachment 2: Request for Information-
Dated January 4 2017
3. Attachment 3: Request for Information-
Dated February 27, 2017

cc w/ encl: Electronic Distribution

CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2017001, INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION REPORT 07201045/2017001, AND EXERCISE OF ENFORCEMENT DISCRETION

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| ☒ SUNSI Review By: DLP | ADAMS ☒ Yes ☐ No | ☒ Non-Sensitive ☐ Sensitive | ☒ Publicly Available ☐ Non-Publicly Available | | |
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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

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|---|---|
| Docket: | 05000483 |
| License: | NPF-30 |
| Report: | 05000483/2017001 and 07201045/2017001 |
| Licensee: | Union Electric Company |
| Facility: | Callaway Plant |
| Location: | Junction Highway CC and Highway O<br>Steedman, MO |
| Dates: | January 1 through March 31, 2017 |
| Inspectors: | T. Hartman, Senior Resident Inspector<br>R. Kumana, Acting Senior Resident Inspector<br>M. Langelier, P. E., Resident Inspector<br>M. Stafford, Acting Resident Inspector<br>L. Carson II, Sr. Health Physicist<br>N. Greene, PhD, Health Physicist<br>J. O'Donnell, CHP, Health Physicist<br>M. Phalen, Sr. Health Physicist<br>E. Simpson, Dry Fuel Storage Inspector, FCDB<br>E. Uribe, Project Engineer |
| Approved By: | David L. Proulx<br>Acting Chief, Project Branch B<br>Division of Reactor Projects |

Enclosure

## SUMMARY

IR 05000483/2017001 and 07201045/2017001; 01/01/2017 - 03/31/2017; Callaway Plant; Integrated and Independent Spent Fuel Storage Installation Inspection

The inspection activities described in this report were performed between January 1 and March 31, 2017, by the resident inspectors at the Callaway Plant and inspectors from the NRC's Region IV office. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014 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," dated July 2016.

No findings were identified.

## PLANT STATUS

Callaway began the inspection period at 100 percent power. On January 6, 2017, the licensee reduced power to approximately 94 percent in response to a condensate pump trip. On January 7, the licensee further reduced power to approximately 90 percent power to address feedwater system oscillations. Callaway returned to 100 percent power on January 14. On March 5, the licensee reduced power to approximately 96 percent in response to a condensate pump trip. On March 6, power was reduced further to 90 percent to allow additional margin for potential secondary plant perturbations. The plant returned to 100 percent power on March 22 and remained there for the rest 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 January 12, 2017, 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 winter storm warnings, and the licensee's planned and actual 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)

.1 Partial Walk-Down

a. Inspection Scope

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

- March 14, 2017, train B motor-driven auxiliary feedwater system
- March 26, 2017, train A diesel-driven fire pump

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 were correctly aligned for the existing plant configuration.

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

b. Findings

No findings were identified.

.2 Complete Walk-Down

a. Inspection Scope

On February 15, 2017, the inspectors performed a complete system walk-down inspection of the 125 Vdc system. The inspectors reviewed the licensee's procedures and system design information to determine the correct 125 Vdc lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, 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)**

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:

- January 19, 2017, train A auxiliary feedwater pump room, area A-14
- January 19, 2017, turbine-driven auxiliary feedwater pump room, area A-15
- January 31, 2017, train A emergency diesel generator room, area D-1
- February 13, 2017, train B mechanical penetration room, area A-25
- March 14, 2017, train B motor-driven auxiliary feedwater pump room, area A-13

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 January 12, 2017, 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 auxiliary feedwater pump area containing 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.

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

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On January 17, 2017, the inspectors observed an evaluated simulator scenario performed by an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the 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:

- March 14, 2017, shift turnover
- March 15, 2017, stroke testing of train B motor-driven auxiliary feedwater valves

In addition, the inspectors assessed the operators' adherence to plant procedures, including Procedure ODP-ZZ-00001, "Operations Department – Code of Conduct," Revision 100 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.

## 1R12 Maintenance Effectiveness (71111.12)

Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed two instances of degraded performance or conditions of safety-significant structures, systems, and components:

- February 15, 2017, emergency diesel generator exciter diodes aging
- March 2, 2017, train B motor-driven auxiliary feedwater valve issues

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 two 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

The inspectors reviewed three 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:

- February 21, 2017, planned switchyard maintenance for disconnect replacements with Montgomery-Callaway line (Mont-Cal) 7 or 8 offsite power out of service
- February 28, 2017, planned switchyard maintenance for disconnect replacements with switchyard bus A out of service
- March 14, 2017, train A motor-driven auxiliary feedwater pump technical specification outage

The inspectors verified that these risk assessments were performed in a timely manner 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.

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

- January 9, 2017, motor replacement on main condensate pump B
- February 23, 2017, breaker PG2101 replacement

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)

.1 Operability Determinations

a. Inspection Scope

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

- January 3, 2017, operability determination of areas where drain rigs were found installed in the plant without an evaluation
- January 31, 2017, operability determination of the train A class 1E switchgear when unrestrained cart found in area
- January 31, 2017, operability determination of the train A emergency diesel generator when cabling found restrained across building isolation
- February 9, 2017, operability determination of safety-related room coolers when non-evaluated covers were found installed
- March 13, 2017, operability determination of train A and B emergency diesel generators for discovered tornado missile hazard to fuel oil transfer piping
- March 22, 2017, operability determination for the train A motor-driven auxiliary feedwater pump flow control valve to steam generator C due to local position indication drifting

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded structure, system, or component 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 structure, system, or component.

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

b. Findings

No findings were identified.

.2 Enforcement Action EA-17-050, Enforcement Discretion for Tornado-Generated Missile Protection Noncompliances

**Description**

Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," Criterion 2, "Design Bases for Protection Against Natural Phenomena," states, in part, that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena, such as tornadoes. Criterion 4, "Environmental and Dynamic Effects Design Basis," states, in part, that structures, systems and components important to safety shall be appropriately protected against dynamic effects including missiles which may result from events and conditions outside the nuclear power unit.

As part of their response to Regulatory Issue Summary 2015-06, "Tornado Missile Protection," the licensee performed a review of protection against tornado-generated missiles required by the current licensing basis. During the review, on March 13, 2017, the licensee identified a portion of the diesel generator fuel oil system that could be susceptible to tornado missiles.

The licensee identified a low-probability scenario where one or more tornado-generated missiles could impact the emergency fuel oil truck connection lines on the south wall of the diesel generator building. The two non-safety-related connection lines are each connected to the safety-related normal fuel oil transfer lines via a tee connection and a normally closed isolation valve. Direct impact by a tornado-generated missile parallel to either train's connection line could impart a load on the tee connection to the normal fuel oil line that had not been evaluated. Failure of the tee connection would result in the associated diesel generator being incapable of performing its safety function.

**Relevant Enforcement Discretion Policy**

On June 10, 2015, the NRC issued Enforcement Guidance Memorandum (EGM) 15-002, "Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance" (Adams Accession Number ML15111A269). The EGM referenced a bounding generic risk analysis performed by the NRC staff that concluded that tornado missile vulnerabilities pose a low risk significance to operating nuclear plants. Because of this, the EGM described the conditions under which the NRC staff may exercise enforcement discretion for noncompliance with the current licensing basis for tornado-generated missile protection. Specifically, if the licensee could not meet the technical specification required actions within the required completion time, the EGM allows the staff to exercise enforcement discretion provided the licensee implements initial compensatory measures prior to the expiration of the time allowed by the limiting condition for operation. The compensatory actions should provide additional protection such that the likelihood of tornado missile effects are lessened. The EGM then requires the licensee to implement more comprehensive compensatory measures within 60 days of issue discovery. The compensatory measures must remain in place until permanent repairs are completed, or until the NRC dispositions the non-compliance in accordance with a method acceptable to the NRC such that discretion is no longer needed. In addition, the issue must be entered into the licensee's corrective action program. Because EGM 15-002 listed Callaway as a Group A plant, enforcement discretion will expire on June 10, 2018. Because the EGM did not provide for enforcement discretion for any related underlying technical violations; any associated underlying technical violations will be assessed through the enforcement process.

**Licensee Actions**

The licensee declared both diesel generators inoperable, complied with the applicable technical specification action statements, initiated a condition report, invoked the enforcement discretion guidance, implemented prompt compensatory measures, and returned the systems, structures, and components to an operable status. The licensee instituted compensatory measures intended to reduce the likelihood of tornado missile effects. These included verifying that guidance was in place for severe weather procedures, abnormal and emergency operating procedures, and procedures dedicated to the Diverse and Flexible Coping Strategy (FLEX), that training on these procedures was current, and that a heightened level of awareness of the vulnerability was established. As an additional compensatory measure, the licensee placed concrete blocks adjacent to the piping penetrations to provide a greater level of protection from tornado generated missiles.

**NRC Actions**

The inspectors' review addressed the material issues in the plant, and whether the measures were implemented in accordance with the guidance in EGM 15-002. The inspectors also evaluated whether the measures as implemented would function as intended and were properly controlled. The inspectors verified through inspection that the EGM 15-002 criteria were met in each case. Therefore, the staff determined that it was appropriate to exercise enforcement discretion and not take enforcement action for the required actions of Technical Specification 3.8.1, "AC Sources – Operating," provided the non-compliances are resolved by June 10, 2018 (EA-17-050).

The inspectors did not fully review the underlying circumstances that resulted in the technical specification violations. As stated in EGM 15-002, violations of other requirements which may have contributed to the technical specification violations will be evaluated independently of EGM implementation. The inspectors will verify restoration of compliance and assess the underlying circumstances during future inspection activities.

## 1R18 Plant Modifications (71111.18)

a. Inspection Scope

On March 21, 2017, the inspectors reviewed a permanent modification to the inboard and outboard bearing oiler piping on the train A auxiliary feedwater pump.

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 operability of the structures, systems, and components as modified.

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

- January 25, 2017, train A control room air conditioning technical specification outage
- February 15, 2017, train A emergency exhaust system technical specification outage

- February 16, 2017, drain piping work affecting control room pressure envelope

- March 15, 2017, train A motor-driven auxiliary feedwater pump after technical specification outage

- March 25, 2017, train A essential service water and ultimate heat sink technical specification outage

The inspectors reviewed licensing and design-basis documents for the structures, systems, and 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, and 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 five 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:

- February 14, 2017, train A containment spray pump comprehensive in-service test

- March 28, 2017, train B safety injection pump in-service test

Containment isolation valve surveillance tests:

- January 5, 2017, containment shutdown and mini-purge valve leak rate test

Other surveillance tests:

- February 27, 2017, train B motor-driven auxiliary feedwater pump and slave relay testing

- March 9, 2017, train B emergency diesel generator fast start and loaded run

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 five 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)**

Training Evolution Observation

a. Inspection Scope

On January 17, 2017, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, offsite 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.

**2. RADIATION SAFETY**

**Cornerstones: Public Radiation Safety and Occupational Radiation Safety**

**2RS5 Radiation Monitoring Instrumentation (71124.05)**

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the radiation monitoring equipment used by the licensee to monitor areas, materials, and workers to ensure a radiologically safe work environment. This evaluation included equipment used to monitor radiological conditions related to normal plant operations, anticipated operational occurrences, and conditions resulting from postulated accidents. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance associated with radiation monitoring instrumentation, as described below:

- The inspectors performed walkdowns and observations of selected plant radiation monitoring equipment and instrumentation, including portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors. The inspectors assessed material condition and operability, evaluated positioning of

instruments relative to the radiation sources or areas they were intended to monitor, and verified performance of source checks and calibrations.

- The inspectors evaluated the calibration and testing program, including laboratory instrumentation, whole body counters, post-accident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors.

- The inspectors assessed problem identification and resolution for radiation monitoring instrumentation. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of the three required samples of radiation monitoring instrumentation, as defined in Inspection Procedure 71124.05.

b. Findings

No findings were identified.

**2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)**

a. Inspection Scope

The inspectors evaluated whether the licensee maintained gaseous and liquid effluent processing systems and properly mitigated, monitored, and evaluated radiological discharges with respect to public exposure. The inspectors verified that abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out of service, were controlled in accordance with the applicable regulatory requirements and licensee procedures. The inspectors verified that the licensee's quality control program ensured radioactive effluent sampling and analysis adequately quantified and evaluated discharges of radioactive materials. The inspectors verified the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- During walkdowns and observations of selected portions of the radioactive gaseous and liquid effluent equipment, the inspectors evaluated routine processing and discharge of effluents, including sample collection and analysis. The inspectors observed equipment configuration and flow paths of selected gaseous and liquid discharge system components, effluent monitoring systems, filtered ventilation system material condition, and significant changes to effluent release points.

- Calibration and testing program for process and effluent monitors, including National Institute of Standards and Technology traceability of sources, primary and secondary calibration data, channel calibrations, set-point determination bases, and surveillance test results.

- Sampling and analysis controls used to ensure representative sampling and appropriate compensatory sampling. Reviews included results of the inter-laboratory comparison program and effluent releases made with inoperable radiation monitors.

- Instrumentation and equipment, including effluent flow measuring instruments, air cleaning systems, and post-accident effluent monitoring instruments.

- Dose calculations for effluent releases. The inspectors reviewed a selection of radioactive liquid and gaseous waste discharge permits and abnormal gaseous or liquid tank discharges, and verified the projected doses were accurate. The inspectors also reviewed 10 CFR Part 61 analyses and methods used to determine which isotopes were included in the source term. The inspectors reviewed land use census results, offsite dose calculation manual changes, and significant changes in reported dose values from previous years.

- Problem identification and resolution for radioactive gaseous and liquid effluent treatment. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of the six required samples of radioactive gaseous and liquid effluent treatment program, as defined in Inspection Procedure 71124.06.

b. Findings

No findings were identified.

## 2RS7 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

The inspectors evaluated whether the licensee's radiological environmental monitoring program quantified the impact of radioactive effluent releases to the environment and sufficiently validated the integrity of the radioactive gaseous and liquid effluent release program. The inspectors also verified that the licensee continued to implement the voluntary Nuclear Energy Institute/Industry Ground Water Protection Initiative. The inspectors reviewed or observed the following items:

- The inspectors observed selected air sampling and dosimeter monitoring stations, sampler station modifications, and the collection and preparation of environmental samples. The inspectors reviewed calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation, and inter-laboratory comparison program results. The inspectors reviewed selected events documented in the annual environmental monitoring report and significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census. The inspectors evaluated the operability, calibration, and maintenance of meteorological instruments and assessed the meteorological dispersion and deposition factors. The inspectors verified the licensee had

implemented a sampling and monitoring program sufficient to detect leakage from structures, systems, or components with credible mechanism for licensed material to reach ground water and reviewed changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.

- Groundwater protection initiative implementation, including assessment of groundwater monitoring results, identified leakage or spill events and entries made into 10 CFR 50.75 (g) records, licensee evaluations of the extent of the contamination and the radiological source term, and reports of events associated with spills, leaks, and groundwater monitoring results.

- Problem identification and resolution for the radiological environmental monitoring program. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of the three required samples of radiological environmental monitoring program, as defined in Inspection Procedure 71124.07.

b. Findings

No findings were identified.

## 2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

The inspectors evaluated the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors interviewed licensee personnel and reviewed the following items:

- Radioactive material storage, including waste storage areas including container labeling/marking and monitoring containers for deformation or signs of waste decomposition.

- Radioactive waste system, including walkdowns of the accessible portions of the radioactive waste processing systems and handling equipment. The inspectors also reviewed or observed changes made to the radioactive waste processing systems, methods for dewatering and waste stabilization, waste stream mixing methodology, and waste processing equipment that was not operational or abandoned in place.

- Waste characterization and classification, including radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides, and processes for waste classification including use of scaling factors and 10 CFR Part 61 analyses.

- Shipment preparation, including packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifests.

- Shipping records for LSA I, II, III, SCOI, II, Type A, or Type B radioactive material or radioactive waste shipments.

- Problem identification and resolution for radioactive solid waste processing and radioactive material handling, storage, and transportation. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of the six required samples of radioactive solid waste processing, and radioactive material handling, storage, and transportation program, as defined in Inspection Procedure 71124.08.

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: Emergency AC Power Systems (MS06) and Cooling Water Support Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of first quarter 2016 through fourth quarter 2016 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 emergency ac power systems and the mitigating system performance index for cooling water support 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 2016 through fourth quarter 2016 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 reactor coolant system specific activity performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

## 4OA2 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 the January 7, 2017 issue where smoke was observed coming out of main condensate pump B followed by the pump tripping for an in-depth follow-up. This was entered into Callaway's corrective action program as Condition Report 201700095. The cause was determined to be a seizure of the lower motor bearing. The licensee replaced the motor and restored the pump to service.

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 corrective actions and that these actions were adequate to correct the condition.

These activities constituted 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)

On January 7, 2017, at 7:01 a.m., a report of smoke in the turbine building was received in the control room. At 7:02 a.m., a fire alarm was received in the control room, and at 7:03 a.m., main condensate pump B tripped. At 7:07 a.m., a report of smoke coming out of main condensate pump B was received and the fire brigade was dispatched. At 7:55 a.m., the fire brigade reported smoke no longer coming from the motor and no signs of fire at the scene.

The NRC resident inspectors communicated the event to supervision, evaluated performance of operators and mitigating systems, and ensured proper licensee actions, and evaluation of event classifications.

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

## 4OA5 Other Activities

.1 Temporary Instruction 2515/192, Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems

a. Inspection Scope

The objective of this performance based temporary instruction is to verify implementation of interim compensatory measures associated with an open phase condition design vulnerability in electric power system for operating reactors. The inspectors conducted an inspection to determine if the licensee had implemented the following interim compensatory measures. These compensatory measures are to remain in place until permanent automatic detection and protection schemes are installed and declared operable for open phase condition design vulnerability. The inspectors verified the following:

- The licensee identified and discussed with plant staff the lessons-learned from the open phase condition events at the United States operating plants including the Byron Station open phase condition and its consequences. This includes conducting operator training for promptly diagnosing, recognizing consequences, and responding to an open phase condition.

- The licensee updated plant operating procedures to help operators promptly diagnose and respond to open phase conditions on offsite power sources credited for safe shutdown of the plant.

- The licensee established and implemented periodic walkdown activities to inspect switchyard equipment such as insulators, disconnect switches, and transmission line and transformer connections associated with the offsite power circuits to detect a visible open phase condition.

- The licensee ensured that routine maintenance and testing activities on switchyard components have been implemented and maintained. As part of the maintenance and testing activities, the licensee assessed and managed plant risk in accordance with 10 CFR 50.65(a) (4) requirements.

b. Findings

No findings were identified.

.2 Operation of an Independent Spent Fuel Storage Facility at Operating Plants (60855.1)

a. Inspection Scope

A routine Independent Spent Fuel Storage Installation (ISFSI) inspection was conducted at the Callaway Plant ISFSI on January 24-26, 2017. The inspectors performed a review of the dry fuel storage records for the canisters loaded into Callaway's Holtec UMAX ISFSI since the last NRC inspection. The review was to verify that the licensee had loaded fuel in accordance with the Holtec Certificate of Compliance technical specification approved contents. Documents reviewed included multi-purpose canister loading maps and records containing fuel assembly specific information, such as assembly decay-heat (kW), cooling time (years), average U-235 enrichment (%), reactor burn-up (MWd/MTU), and other information. The multi-purpose canister contents reviewed during the inspection were found to meet all fuel requirements specified in the Holtec Certificate of Compliance.

The inspectors requested documentation related to maintenance of the cask handling crane and the testing requirements for the licensee's special lifting devices. Documents were provided that demonstrated the cask handling crane was inspected annually in accordance with the requirements of the ASME B30.2 standards prior to the first dry fuel loading campaign in 2015. The 2016 crane inspection was delayed until February 2017, but was completed satisfactorily. The cask handling crane had not been used for dry fuel storage operations since 2015. The annual maintenance as required by ANSI N14.6 standards for special lifting devices was completed prior to the 2015 loading campaign. Callaway had plans to inspect the HI-TRAC lift yoke and the HI-TRAC lift yoke extension according to ANSI N14.6 standards by March 1, 2018, in support of the next scheduled dry fuel loading campaign. Callaway initiated Condition Report 201700326 to track the progress of this upcoming inspection.

The Callaway UMAX ISFSI is located inside of the reactor site protected area about 600 feet to the north of the reactor containment structure. The inspectors reviewed the radiological conditions of the Callaway ISFSI through a review of the most recent radiological survey and two years' of optically stimulated luminescent dosimeter monitoring data from around the ISFSI pad. Two licensing representatives and a radiation protection manger accompanied the NRC inspectors during the inspection of the ISFSI pad. The pad was properly posted as a radioactive materials/radiologically controlled area. A radiological survey was performed by the NRC inspectors with a

Ludlum Model-19 sodium-iodide survey meter (NRC #033906, calibration due July 13, 2017) which measured gamma exposure rates in microRoentgens per hour (μR[1]/h). The inspector's measurements confirmed site survey records. The radiological conditions in and around the ISFSI were exceptionally low, 3-6 μR/h, essentially background. This was because the spent fuel stored in the UMAX ISFSI is all below ground level. Elevated radiological readings were only present in very close proximity to the storage vault air inlet vents of the six loaded ISFSI vaults. The measurements at the inlet vents ranged from 150-250 μR/h. All accessible areas of the UMAX ISFSI were below the 10 CFR 20.1502(a)(1) limit for unmonitored individuals, 500 mrem per year. In addition, fence-line doses from the ISFSI pad were essentially at background levels. Offsite locations were below the 10 CFR 72.104(a)(2) requirement of less than 25 mrem per year above background due to direct radiation from the ISFSI.

An onsite review of the Quality Assurance (QA) audit and surveillance reports related to dry cask storage activities at the Callaway Plant was performed by the NRC inspectors. Only one QA audit report had been generated by Callaway since the last NRC inspection was conducted, on January 6, 2016. The nuclear oversight audit looked at all of the QA areas present in 10 CFR Part 72, Subpart G, including Organization, Design Control, Test Control, QA Program, QA Records, et al. The audit found all areas of the QA program to have been effectively implemented at Callaway. The audit resulted in three condition reports of low safety significance. All audit identified conditions had been properly categorized and resolved by the licensee. In addition, the NRC inspectors reviewed a list of cask handling crane and ISFSI operations related condition reports that were issued since the previous NRC inspection in September 2015. Of those listed, 41 condition reports were selected for further review. The condition reports reviewed by the NRC were related to a variety of problems that arose during the first dry fuel storage loading campaign at Callaway. The condition reports reviewed by the inspectors were well documented and properly categorized based on the safety significance of the conditions. Based on the types of issues raised, the licensee demonstrated a high attention to detail and a suitably low threshold for placing issues into its corrective action program. No NRC safety concerns were identified related to the audit reports or condition reports reviewed.

The NRC inspectors reviewed three randomly selected weeks of HI-STORM UMAX daily vent surveillance records to ensure that the Holtec Certificate of Compliance Technical Specification 3.1.2 requirements were being met for fuel stored on the ISFSI pad. All documentation reviewed demonstrated the licensee verified that the inlet and outlet vents were unblocked during the dates reviewed with no abnormalities reported.

The licensee's 10 CFR 72.212 Evaluation Report was reviewed to verify site characteristics were still bounded by the Holtec HI-STORM UMAX cask system's design basis. Callaway's 10 CFR 72.212 evaluation report at the time of the inspection was Revision 1, dated December 7, 2015. One revision had been performed to the 72.212 evaluation report since the last NRC routine ISFSI inspection. Changes to the site's 72.212 evaluation report were made to reflect the six multi-purpose canisters loaded during their first loading campaign and to enumerate unincorporated changes against

[1] For the purposes of making comparisons between NRC regulations based on dose-equivalent (rem) and measurements made in Roentgens, it may be assumed that one Roentgen equals one rem. (http://www.nrc.gov/about-nrc/radiation/protects-you/hppos/qa96.html)

the Holtec HI-STORM UMAX final safety analysis report. The 10 CFR 72.48 screen associated with the change was reviewed. The screen was determined to be adequate and the changes to the 72.212 evaluation report were found to be bounded by the Holtec design basis.

The licensee's 10 CFR 72.48 screenings and evaluations for ISFSI program changes since the last NRC routine ISFSI inspection were reviewed to determine compliance with regulatory requirements. The inspectors reviewed several 72.48 screens that were primarily for procedure revisions to capture "lessons learned" during their initial dry fuel storage campaign in 2015. There was one notable 72.48 safety evaluation that was in progress during the NRC inspection. That safety evaluation was being performed in support of the installation of a cathodic protection system for the Callaway UMAX ISFSI. The proposed cathodic protection system installation would require drilling holes into the concrete ISFSI top pad and modification to the concrete reinforcing bars. The evaluation was not competed at the time of the NRC inspection. The NRC inspectors will review new 72.48 safety evaluations and screens during the next inspection, planned for Fall 2018, NRC reviewed a list of cask handling crane related 50.59 screens that had been performed since the previous NRC inspection. Those screens were related to changes in preventative maintenance and crane operational enhancements. Callaway had not performed any cask handling crane related 50.59 safety evaluations since the last NRC inspection.

The inspectors determined that all ISFSI related 72.48 screens and evaluations and crane related 50.59 screens were adequately evaluated by the licensee.

b. Findings

No findings were identified.

## 4OA6 Meetings, Including Exit

Exit Meeting Summary

On January 26, 2017, the inspectors presented results of the ISFSI inspection to Mr. B. Cox, Senior Director Nuclear Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. No proprietary information was examined during the inspection.

On February 15, 2017, the inspectors presented results of the temporary instruction inspection 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 had been returned or destroyed.

On March 8, 2017, the inspectors presented results of the radiation safety inspection 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 had been returned or destroyed.

On March 29, 2017, the inspectors presented results of the integrated quarterly inspection 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.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

Licensee Personnel

B. Cox, Senior Director, Nuclear Operations
A. Dothage, Technician, Radiation Protection Support
J. Geyer, Director, Radiation Protection
C. Graham, Consulting Health Physicist
M. Haag, Senior Design Engineer
J. Houston, Senior Health Physicist, Radiation Protection
G. Hurla, Supervisor, Radiation Protection
S. Kovaleski, Director, Engineering Design
J. Kovar, Licensing Engineer
R. Lutz, Project Engineer
D. Mangold, Supervisor, Radiation Protection
V. Miller, Supervising Health Physicist
S. Petzel, Engineer, Regulatory Affairs
E. Ptasznik, Licensing Engineer
G. Rauch, Manager, Emergency Preparedness
G. Reinhard, Electrical Systems Engineer
J. Reuter, Technician, Radiation Protection
G. Roesner, Engineering Consultant
D. Shafer, Licensing Consultant
E. Stewart, Operations Contractor
F. Stuckey, Health Physicist
K. Tipton, Supervisor, Engineering Systems
D. Traub, Technician, Radiation Protection Support
R. Turner, Supervisor, Radwaste Operations
L. Watson, System Engineer

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None.

### LIST OF DOCUMENTS REVIEWED

**Section 1R01: Adverse Weather Protection**

Procedures

| Number | Title | Revision |
|---|---|---|
| OTO-ZZ-00012 | Severe Weather | 33 |

Condition Reports

201700215 201700236

**Section 1R04: Equipment Alignment**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00750 | Hazard Barrier Program | 38 |
| MSE-NK-QB011 | Inspection and Surveillance of NK11 Battery and Battery Charger NK21/NK25 | 22 |
| MSE-NK-QB014 | Inspection and Surveillance of NK14 Battery and Battery Charger NK24/NK26 | 22 |
| OTN-KC-00001 | Fire Protection System | 22 |
| OTN-NK-00001 Addendum 1 | 125VDC Bus NK01 and Distribution System | 4 |
| OTN-NK-00001 Checklist 2 | NK01 Class 1E 125 VDC Distribution Swbd Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 3 | NK41 Class 1E 125 VDC Distribution Panel Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 4 | NK51 Class 1E 125 VDC Distribution Panel NK51 Breaker Alignment and Flashing for Grounds | 11 |
| OTN-NK-00001 Checklist 5 | NK51A Class 1E 125 VDC Emergency Lighting Distribution Panel Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 7 | NK02 Class 1E 125 VDC Distribution Swbd Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 8 | NK42 Class 1E 125 VDC Distribution Panel Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 10 | NK03 Class 1E 125 VDC Distribution Swbd Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 11 | NK43 Class 1E 125 VDC Distribution Panel Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 13 | NK04 Class 1E 125 VDC Distribution Swbd Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist14 | NK44 Class 1E 125 VDC Distribution Panel Breaker Alignment and Flashing for Grounds | 9 |
| OTN-NK-00001 Checklist 15 | NK54 Class 1E 125 VDC Distribution Panel Breaker Alignment and Flashing for Grounds | 11 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22AL01(Q) | Piping and Instrumentation Diagram Auxiliary Feedwater System | 47 |

Jobs

10507296

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| KC-05 | Fire Pump Performance Requirements | 1 |
| NK-05 | Class 1E Battery Capacity | 10 |
| RFR 201201033 | Provide Basis for HELB Program | 0 |

**Section 1R05: Fire Protection**

Procedures

| Number | Title | Revision |
|---|---|---|
| | Fire Preplan Manual | 39 |

Jobs

16500995

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| KC-50 | A-15 Detailed Fire Modeling Report | 0 |
| KC-93 | Fire Safety Analysis for Fire Area A-13 | 1 |
| KC-94 | Fire Safety Analysis for Fire Area A-14 | 1 |
| KC-95 | Fire Safety Analysis for Fire Area A-15 | 1 |
| KC-75 | D-1 Detailed Fire Modeling Report | 0 |
| KC-149 | Fire Safety Analysis for Fire Area D-1 | 1 |
| KC-105 | Fire Safety Analysis for Fire Area A-25 | 1 |
| RFR 201009031 | Evaluate Structural Steel Thermal Shorts from Wolf Creek OE | 0 |

**Section 1R06: Flood Protection Measures**

Condition Reports

201603981 201604381 201608513

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| M-FL-04 | Summary of Flood Levels in all Aux Bldg. Rooms Due to a Pipe Break/Crack | 2 |
| M-FL-04, Revision 2, Addendum 5 | Revised Flooding Analysis for Rooms 1206 and 1207 | |
| M-FL-04, Revision 2, Addendum 6 | Impact of MP 13-0033 – Hardened Condensate Storage Tank Refuel 21 Tie-Ins | |
| M-FL-13 | Auxiliary Building Flooding: Calculate the Maximum Flood Level in Auxiliary Building Rooms 1304, 1305, 1324, 1325, 1326, 1327, 1328, 1329, 1330 and 1331 due to a Pipe Break or Crack | 1 |

**Section 1R11: Licensed Operator Requalification Program**

Procedures

| Number | Title | Revision |
|---|---|---|
| ODP-ZZ-00001 | Operations Department – Code of Conduct | 100 |
| OSP-AL-V001A | Train A Auxiliary Feedwater Valve Inservice Test | 56 |

Miscellaneous

| Number | Title | Date |
|---|---|---|
| DS-Cycle 17-1 | Dynamic Simulator Exam Scenario | December 23, 2016 |

**Section 1R12: Maintenance Effectiveness**

Procedures

| Number | Title | Revision |
|---|---|---|
| EDP-ZZ-01128 | Maintenance Rule Program | 25 |
| EDP-ZZ-01128, Appendix 4 | Maintenance Rule System Functions | 16 |

Condition Reports

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|---|---|---|---|---|
| 201110674 | 201104826 | 201203174 | 201406826 | 201408399 |

Condition Reports

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|---|---|---|---|---|
| 201505332 | 201505796 | 201506853 | 201600738 | 201602785 |

Jobs

| | | | | |
|---|---|---|---|---|
| 13505272 | 13505696 | 14512748 | 15000152 | 15000153 |
| 16000928 | | | | |

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| AL-30 | Auxiliary Feedwater System Performance During a Loss of Normal Feedwater Flow and Loss of Non-Emergency A/C Power | 6C |
| LDCN 11-0040 | 201104826 – Revise Tech Spec SR 3.7.5 to Incorporate Revision of AL-30 Rev. 5 | March 15, 2012 |
| PM1008935 | Replace the Inservice Power Rectifier Diodes in the Emergency Diesel Generator | |
| PM1008936 | Replace the Inservice Power Rectifier Diodes in the Emergency Diesel Generator | |

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

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00312 | Probabilistic Risk Assessment (PRA) | 10 |
| EDP-ZZ-01129 | Callaway Energy Center Risk Assessment | 46 |
| ODP-ZZ-00001 Addendum 15 | Operability and Functionality Determinations | 11 |
| ODP-ZZ-00002 | Equipment Status Control | 87 |
| ODP-ZZ-00002 Appendix 1, Checklist 3 | Placing Train B Protected Equipment Barriers, Mode 1-4 | 400 |
| ODP-ZZ-00002 Appendix 2 | Risk Management Actions for Planned Risk Significant Activities | 12 |
| OOA-ZZ-SM001 | Safety Monitor | 5 |
| OSP-NE-00003 | Technical Specifications Actions – A.C. Sources | 31 |
| OTO-ZZ-00012 | Severe Weather | 34 |

Procedures

| Number | Title | Revision |
|---|---|---|
| PRA-ZZ-00001 Appendix A | Documentation of the PRA Model | 0 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201607971 | 201700095 | 201700899 | 201700917 | 201700920 |
| 201701217 | | | | |

Jobs

| | | | | |
|---|---|---|---|---|
| 12003895 | 12003896 | 16005066 | 16005069 | 16005060 |

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| | Event Review Team Meeting Summary for CR 201700917 | February 24, 2017 |
| | Work Week 1/8/17 – 1/14/17 Schedule | January 6, 2017 |
| | Post Critique for Week of 01-01-17 | 0 |
| ZZ-492 | Loss of Offsite Power Multiplication Factors for use in the Safety Monitor | 1 |
| MP 07-0069 | Replace 480V Load Center Breakers with New Square D Masterpact Breakers | 2 |

**Section 1R15: Operability Evaluations**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00500, Appendix 1 | Operability and Functionality Determinations | 28 |
| ODP-ZZ-00001 Addendum 15 | Operability and Functionality Determinations | 11 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22EJ01(Q) | Piping and Instrumentation Diagram – Residual Heat Removal System | 62 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22JE01(Q) | Piping and Instrumentation Diagram – Emergency Fuel Oil System | 19 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201609404 | 201700235 | 201700502 | 201700520 | 201700665 |
| 201700662 | 201700840 | 201701264 | 201701458 | |

Miscellaneous

| Number | Title | Date |
|---|---|---|
| | Operations Narrative Logs dated December 28-29, 2016 | |
| | Operations Narrative Logs dated January 19, 2017 | |
| | Operations Narrative Logs dated March 13, 2017 | |
| CMP 93-1047A | Install Conduit for Telephone Cables for a NIS Terminal | June 13, 1995 |
| RFR 003487A | Supplemented – Breaker Test Area in NB01 & NB02 Switchgear Rooms | February 6, 2001 |
| RFR 021810A | Update Drawings for ECCS Venting Connections | September 6, 2002 |
| RFR 14425B | B D/G ESW Piping Rigid Struts and Building Motion | January 27, 1994 |

**Section 1R18: Plant Modifications**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00662 Appendix A | ASME Section XI Repair/Replacement Program Mandatory Requirements – Class 1, 2 and 3 Items and their NF Supports (Fourth Inspection Interval) | 5 |

Jobs

| | | |
|---|---|---|
| 15000525 | 15000528 | 15000529 |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| MP 15-0009 | AFW Pump Oilers | 0 and 1 |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| Health Issue 2011011 | Constant Level Oiler Mounting on Auxiliary Feedwater Pumps (PH) | |

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

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00322, Appendix C | Job Planning | 46 |
| APA-ZZ-00322, Appendix E | Post Maintenance Test Program | 11 |
| APA-ZZ-00352 | Callaway Quality Control Inspection Program | 19 |
| EDP-ZZ-01012 | Control Room Envelope Habitability Program | 3 |
| EDP-ZZ-04107 | HVAC Pressure Boundary Control | 29 |
| ITP-ZZ-00004 | Response Time Testing Program | 17 |
| MPM-ZZ-QA001 | Limitorque Actuator Inspection and Lubrication | 47 |
| OSP-AL-V001A | Train A Auxiliary Feedwater Valve Inservice Test | 56 |
| OSP-AL-P001A | Motor Driven Aux. Feedwater Pump A Inservice Test – Group A | 64 |
| OSP-EF-P001A | ESW Train A Inservice Test | 77 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22LA02 | Piping and Instrumentation Diagram Communications Corridor and Control Bldg. Sanitary Drainage System | 6 |
| M-23LA02 | Sanitary Drainage (LA) Control Bldg. & Communications Corr. El. 2000'-0" and Above | 3 |
| M-23LA04 | Sanitary Drainage (LA) Sanitary Riser Diagram | 8 |

Condition Reports

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|---|---|---|---|---|
| 201701324 | 201701331 | 201701335 | 201701501 | 201701513 |
| 201701537 | 201701543 | | | |

Jobs

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|---|---|---|---|---|
| 07501721 | 10512546 | 11501911 | 11501912 | 11507711 |

Jobs

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|---|---|---|---|---|
| 11508665 | 11508674 | 12509844 | 12504705 | 12511835 |
| 14002299 | 14503008 | 14503044 | 14504024 | 14509212 |
| 14510755 | 15000528 | 15513120 | 15001334 | 15001731 |
| 15003697 | 15506057 | 15506083 | 15506357 | 15509962 |
| 16500995 | 16006658 | | | |

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| | Callaway Energy Center Operational Quality Control Manual | 29 |
| | Witness Waiver Inspection Report | February 1, 2017 |
| MP 13-0041 | Mitigate Vibration Effects on SGK04 and SGK05 | 0 |
| CA2982 | Pressure Boundary Breach Evaluation Form for Job #16006658 | January 26, 2017 |

**Section 1R22: Surveillance Testing**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00340 Appendix 4 | Surveillance Frequency Control Program STI List | 7 |
| APA-ZZ-00356 | Pump and Valve Inservice Testing Program | 24 |
| APA-ZZ-00356 Appendix 2 | IST Pumps Design Flow Rates | 0 |
| ESP-SM-01001 | Containment Leakage Rate Testing Program | 25 |
| OSP-AL-P001B | Motor Driven Aux. Feedwater Pump B Inservice Test | 61 |
| OSP-GT-L160B | Containment Mini Purge Valve Leak Rate Test | 7 |
| OSP-GT-L161B | Containment Shutdown and Mini Purge Valve Leak Rate Test | 9 |
| OSP-EM-P001B | Safety Injection Train B Inservice Test – Group B | 50 |
| OSP-EN-P001A | Train A Containment Spray Pump Inservice Test | 46 |
| OSP-NE-0001B | Standby Diesel Generator B Periodic Tests | 65 |
| OSP-SA-0007B | Train B AFAS Slave Relay Test | 36 |
| OTN-ZZ-00004 | Operation of the Leak Rate Monitor (LRM) | 8 |

Drawings

| Number | Title | Revision |
|---|---|---|
| M-22EM01(Q) | High Pressure Coolant Injection System Piping and Instrumentation Diagram | 38 |
| M-22GT01(Q) | Containment Purge Systems HVAC Piping and Instrumentation Diagram | 26 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201508392 | 201700979 | 201700980 | 201701077 | |

Jobs

| | | | | |
|---|---|---|---|---|
| 14505453 | 15004983 | 15506854 | 16005647 | 165104088 |
| 16512273 | 16514131 | 17001243 | | |

Miscellaneous

| Number | Title | Revision |
|---|---|---|
| | Inservice Testing Program | 32 |
| COMN 41388 | Commitment – Inoperability of Safety Injection Trains and T/S 3.0.3 | 0 |
| M-EN-44 | Pressure Drop Across EN-FO-01 Orifice | 0 |
| M-EN-40 | CSS Flowrates Used in FSAR | 0 |

**Section 1EP6: Drill Evaluation**

Procedures

| Number | Title | Revision/Date |
|---|---|---|
| | Drill - Callaway Plant Emergency Notification - Drill | January 17, 2017 |
| EIP-ZZ-00101, Addendum 2 | Emergency Action Level Technical Bases Document | 11 |

Miscellaneous

| Number | Title | Revision/Date |
|---|---|---|
| DS-Cycle 17-1 | Dynamic Simulator Exam Scenario | December 23, 2016 |

**Section 2RS5: Radiation Monitoring Instrumentation**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-01003 | Offsite Dose Calculation Manual | 21 |
| HDM-ZZ-01300 | Internal Dose Assessment Guidelines | 0 |
| HDP-ZZ-01300 | Internal Dosimetry Program | 34 |
| HDP-ZZ-04700 | Count Room and Whole Body Counter Quality Control Program | 19 |
| HTP-ZZ-04102-DTI-FLUKE-451-Cal | FLUKE 451B Ion Chamber Calibration | 5 |
| HTP-ZZ-04175-DTI-PM7-CAL | Eberline Model PM-7 Portal Monitor Calibration | 2 |
| HTP-ZZ-04176-DTI-SAM12-CAL | Thermo Fisher Model SAM-12 Small Article Monitor Calibration | 2 |
| HTP-ZZ-04177-DTI-PCM2-CAL | Eberline PCM-2 Calibration | 2 |
| HTP-ZZ-04178-DTI-TELEPOLE-OP | ROTEM Telepole Survey Meter Operation | 5 |
| HTP-ZZ-04270-DTI-DMC2000S-AUTO | Calibration of MGPI DMC2000S Electronic Dosimeters Automatic | 8 |
| KDP-ZZ-00013 | Emergency Response Facility and Equipment Evaluation | 15 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201505336 | 201505803 | 201506851 | 201506378 | 201508335 |
| 201508442 | 201508841 | 201509751 | 201601242 | 201601836 |
| 201603887 | 201604693 | 201605181 | 201700586 | 201701035 |

Audits and Self-Assessments

| Number | Title | Date |
|---|---|---|
| SSA 201406362 | Self Assessment | May 2015 |

Effluent Discharge Monitor Calibrations

| Number | Title | Date |
|---|---|---|
| 12508817/500 | HBRE0018 | June 2015 |
| 14502102/500 | GHRE0010A | June 2015 |
| 14503562/500 | GTRE0021B | June 2015 |
| 14508158/500 | GHRE0010B | August 2015 |
| 105114298/500 | GTRE0021A | December 2015 |

Radiation Protection Instrument Calibrations

| Number | Title | Date |
|---|---|---|
| CAM-4034-HP | AMS-4 | February 9, 2017 |
| CAM-4046-HP | AMS-4 | February 9, 2019 |
| HTP-ZZ-04136-DTI-PING-APANTC-CAL | Apantec PING-1A Continuous Air Monitor Calibration | February 16, 2017 |
| GMI-4135-HP | AMP-200 | October 26, 2016 |
| GMI-4179-HP | Telepole | February 7, 2017 |
| ION-2006-HP | Ion Chamber 2003 | February 7, 2017 |
| ION-2006-HP | Ion Chamber 2006 | February 7, 2017 |
| ION-2006-HP | Ion Chamber 2007 | February 7, 2017 |
| ION 4329-HP | Fluke Ion Chamber 2683 | August 31, 2016 |
| ION 4329-HP | Fluke Ion Chamber 2685 | January 12, 2017 |
| PM-022038-01 | Electronic Dosimeter | February 28, 2017 |
| PM-024041-01 | Electronic Dosimeter | February 28, 2017 |
| PM-4031-HP | PCM-2 | November 12, 2016 |
| PM-4040-HP | PM-12 | February 6, 2017 |
| TM-4007-HP | SAM-12 | May 24, 2016 |
| TM-4008-HP | SAM-12 | November 28, 2016 |
| TM-4009-HP | SAM-12 | August 11, 2016 |

Miscellaneous

| Number | Title | Date |
|---|---|---|
| | Calibration of the Canberra Fastscan System for FS-5300 | October 10, 2013 |
| | Calibration of the Canberra Fastscan System for FS-5301 | October 10, 2013 |

**Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-01003 | Offsite Dose Calculation Manual | 21 |
| ESP-GG-03004 | FGG02A In-Place Charcoal Filter Test | 16 |
| ESP-GG-03005 | FGG02A By-Pass Leakage Test | 15 |
| ESP-GK-03010 | FGK01 By-Pass Leakage Test | 10 |
| ESP-GK-03011 | FGK02A By-Pass Leakage Test | 11 |
| ESP-GK-03012 | FGH01B By-Pass Leakage Test | 14 |
| HDP-ZZ-07000 | Radiological Environmental Monitoring Program and Groundwater Protection Initiative | 8 |
| HTP-ZZ-02006 | Liquid Radwaste Release Permit (Batch) | 90 |
| HTP-ZZ-02007 | Gaseous Radwaste Release Permit (Gaseous Decay Tank) | 47 |
| HTP-ZZ-02008 | Gaseous Radwaste Release Permit (RW Bldg. Ventilation) | 28 |
| HTP-ZZ-02009 | Gaseous Radwaste Release Permit (Fuel Handling Bldg. Ventilation) | 27 |
| HTP-ZZ-02009, Addendum A | Gaseous Radwaste Release Permit | 7 |
| HTP-ZZ-02012 | Gaseous Radwaste Release Permit (Containment) | 50 |

Audits and Self-Assessments

| Title | Date |
|---|---|
| Nuclear Oversight Audit Radiological and Non-REMP, AP16003 | July 15, 2016 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201404299 | 201405071 | 201505219 | 201503472 | 201505221 |
| 201603183 | 201603668 | 201605765 | 201610310 | 201607991 |
| 201608870 | 201700135 | | | |

Radioactive Effluent Release Permits

| Number | Title | |
|---|---|---|
| RP102017L0007 | Liquid Radwaste Discharge Monitor Tank B | February 17, 2017 |
| RP122017G0001 | Unit Plant Vent | February 23, 2017 |
| RP132017G0006 | Radwaste Building. Vent | February 23, 2017 |
| RP11A2017G0009 | Containment. Vent | February 23, 2017 |

In-Place Filter Testing and Carbon Testing Records

| Air Filtration System | Train | Test | Date |
|---|---|---|---|
| Aux/Fuel Emergency | FGG02A | HEPA (In-Place) | July 14, 2014 |
| Aux/Fuel Emergency | FGG02A | HEPA (In-Place) | September 1, 2015 |
| Control Room Ventilation | FGK01A | HEPA (In-Place) | July 15, 2015 |
| Control Room Ventilation | FGK01A | HEPA (In-Place) | February 25, 2015 |
| Control Room Ventilation | FGK02B | HEPA (In-Place) | February 25, 2015 |

Effluent Discharge Monitor Calibrations

| Number | Title | Date |
|---|---|---|
| 14503562 | GTRE0021B | April 14, 2014 |
| 12513010 | GTRE0021A | June 2, 2014 |
| 14501959 | HBRE0018 | July 15, 2015 |
| 12509292 | GTRE0021B | August 26, 2015 |
| 10514298 | GTRE0021A | December 2, 2015 |
| 15508817 | HBRE0018 | February 17, 2017 |

Miscellaneous Documents

| Number | Title | Date |
|---|---|---|
| | Radiation Monitor Operability Log | Selected Dates 2014-2017 |

| | | |
|---|---|---|
| Chapters 11&12 | FSAR | May 2015 |
| Q3-2016 | System Health Report: SQ – Radiation Monitoring | September 26, 2016 |
| Q4-2016 | System Health Report: SQ – Radiation Monitoring | December 12, 2016 |
| 2014 | Annual Radioactive Effluent Release Report | April 2015 |
| 2015 | Annual Radioactive Effluent Release Report | April 2016 |

**Section 2RS7: Radiological Environmental Monitoring Program**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-01000 | Callaway Energy Center Radiation Protection Program | 42 |
| APA-ZZ-01003 | Offsite Dose Calculation Manual | 21 |
| HDP-ZZ-07000 | Radiological Environmental Monitoring Program and Groundwater Protection Initiative | 8 |
| HTP-ZZ-04143 | Operation of the Intake Structure River Water Sampler | 1 |
| HTP-ZZ-04143 | Operation of the Portland River Water Composite Sampler | 9 |
| HTP-ZZ-07001-DTI-AIR SAMPLING | Collection and Shipping of Environmental Air Samples | 10 |
| HTP-ZZ-07001-DTI-WATER SAMPLING | Collection and Shipping of Environmental Water Samples | 7 |
| HTP-ZZ-07100-DTI-LAND-USE-CENSUS | Land Use Census Program | 4 |
| HTP-ZZ-07101-DTI-REMP-SMPL-SCHED | REMP Sample Location and Analysis Schedule | 27 |
| RP-DTI-ENVIRON-SPILLRESP | Response to Spills or Leaks of Radioactive Material into Groundwater | 9 |

Audits, Self-Assessments, And Surveillances

| Number | Title | Date |
|---|---|---|
| AP16003 | Nuclear Oversight Audit of the Radiological and Non-Radiological Environmental Monitoring Programs | July 15, 2016 |
| NUPIC 23295 | Vendor Audit Report: Environmental Inc. – Midwest Laboratory | September 1, 2011 |
| SBK 14-019 | Vendor Audit Report: Environmental Dosimetry Company | September 24, 2014 |
| 12-006 | Closeout Audit of Environmental Dosimetry Company | September 6, 2012 |
| 23869 | Audit Closeout of Environmental Inc. – Midwest Laboratory | October 15, 2014 |
| 201406362-5.2 | Radiation Safety Team Pre-Inspection | May 31, 2015 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201505057 | 201506436 | 201600192 | 201602668 | 201602672 |
| 201602681 | 201603408 | 201604701 | 201604920 | 201604939 |
| 201605279 | 201605343 | 201606071 | 201606339 | 201700050 |
| 201700071 | 201700198 | | | |

Miscellaneous Documents

| Title | Date |
|---|---|
| Calculation of Long-Term Meteorological Dispersion Parameters | April 30, 2015 |
| Callaway Annual Radioactive Effluent Release Report | 2014 |
| Callaway Annual Radioactive Effluent Release Report | 2015 |
| Callaway Annual Radiological Environmental Operating Report | 2014 |
| Callaway Annual Radiological Environmental Operating Report | 2015 |
| Callaway Met Tower Calibration and Maintenance Records | 2015 and 2016 |
| Chapters 2.3 and 16.11 of the Callaway Final Safety Analysis Report | January 2013 |
| Evaluation of Air Sampler Locations with Respect to the Recalculated Dispersion Parameters | August 18, 2015 |
| Evaluation of the 2015 Annual Land Use Census | March 10, 2016 |
| Evaluation of the 2016 Annual Land Use Census | January 19, 2017 |
| Selected Environmental Air Sample Calibration and Maintenance Records | 2015 and 2016 |

**Section 2RS8: Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-01000, Appendix A | Control of Radioactive Material | 20 |
| APA-ZZ-01011 | Process Control Program (PCP) | 13 |
| HDP-ZZ-09000 | Radioactive Material Shipping Program | 3 |
| HTP-ZZ-09003 | Shipment of Radioactive Materials | 4 |
| HTP-ZZ-09004 | Shipment of Radioactive Wastes | 3 |
| RDP-ZZ-00200 | Radwaste Operational Guidelines | 21 |
| RTN-HC-01000 | Preparation of Radwaste/Radioactive Material for Shipment | 25 |
| RTN-HM-00200 | Radioactive Waste Container Control Program | 21 |

Audits and Self-Assessments

| Number | Title | Date |
|---|---|---|
| 201500405-10 | Simple Self-Assessment – Radioactive Shipping Program | July 22, 2015 |

Condition Reports

| | | | | |
|---|---|---|---|---|
| 201505174 | 201505512 | 201506896 | 201507027 | 201507102 |
| 201507921 | 201600532 | 201600909 | 201603840 | 201606318 |
| 201608102 | 201608870 | | | |

Radioactive Material and Waste Shipments

| Number | Title | Date |
|---|---|---|
| 15-003 | Type B Waste Shipment to Energy Solutions - Erwin | December 1, 2015 |
| 15-019 | >Type A LSA Waste Shipment to Energy Solutions - Barnwell | September 24, 2015 |
| 16-013 | Type A LSA Waste Shipment to Enery Solutions - Clive | August 17, 2016 |
| 16-036 | RAM SCO Shipment to BWX Technologies | May 19, 2016 |
| 16-055 | >Type A LSA Waste Shipment to Alaron | November 16, 2016 |

Miscellaneous Documents

| Number | Title | Date |
|---|---|---|
| 2015 | Annual Radioactive Effluent Release Report | April 26, 2016 |
| 2014 | Annual Radioactive Effluent Release Report | |
| 201720075 | Licensing Document Change Request | January 20, 2017 |

**Section 4OA1: Performance Indicator Verification**

Condition Reports

201600739 201602074 201603581 201606547

Jobs

16501943

Miscellaneous

| Number | Title | Revision Date |
|---|---|---|
| | Reactor Coolant System Dose Equivalent I-131 Activity Data for January 1, 2016 to December 31, 2016 | |
| | NRC Performance Indicator Transmittal Report, First Quarter 2016, Mitigating Systems Cornerstone | April 13, 2016 |
| | NRC Performance Indicator Transmittal Report, Second Quarter 2016, Mitigating Systems Cornerstone | July 11, 2016 |
| | NRC Performance Indicator Transmittal Report, Third Quarter 2016, Mitigating Systems Cornerstone | October 10, 2016 |
| | NRC Performance Indicator Transmittal Report, Fourth Quarter 2016, Mitigating Systems Cornerstone | January 10, 2017 |
| | NRC Performance Indicator Transmittal Report, First Quarter 2016, Barrier Integrity Cornerstone | April 9, 2016 |
| | NRC Performance Indicator Transmittal Report, Second Quarter 2016, Barrier Integrity Cornerstone | July 7, 2016 |
| | NRC Performance Indicator Transmittal Report, Third Quarter 2016, Barrier Integrity Cornerstone | October 5, 2016 |
| | NRC Performance Indicator Transmittal Report, Fourth Quarter 2016, Barrier Integrity Cornerstone | January 4, 2017 |

**Section 4OA2: Identification and Resolution of Problems**

Procedures

| Number | Title | Revision |
|---|---|---|
| OTO-AE-00001 | Feedwater System Malfunction | 35 |

Condition Reports

| | | | |
|---|---|---|---|
| 201700095 | 201700097 | 201700100 | 201700155 |

**Section 4OA3: Event Follow-Up**

Procedures

| Number | Title | Revision |
|---|---|---|
| OTO-AE-00001 | Feedwater System Malfunction | 35 |

Condition Reports

| | | | |
|---|---|---|---|
| 201700095 | 201700097 | 201700100 | 201700155 |

**Section 4OA5: Other Activities**

Procedures

| Number | Title | Revision |
|---|---|---|
| APA-ZZ-00500 | Corrective Action Program | 66 |
| APA-ZZ-00143 | 10 CFR 50.59 and 10 CFR 72.48 Reviews | 16 |
| EDP-ZZ-01131 | Engineering System Walkdowns | 6 |
| ETP-SG-00001 | Response To A Seismic Event | 13 |
| ETP-ZZ-04020 | Fuel Selection and Cask Loading for Dry Cask Storage | 0 and 1 |
| FDP-ZZ-00105 | 10 CFR 72.212 Report Maintenance | 0 |
| ODP-ZZ-0016E | Operations Technicians Watchstation Practices and Rounds | 40 |
| OOA-SA-C066X | Engineered Safety Feature (ESF) Status Panel SA066X Alarm Information | 16 |
| OOA-SA-C066Y | Engineered Safety Feature (ESF) Status Panel SA066Y Alarm Information | 17 |

Procedures

| Number | Title | Revision |
|---|---|---|
| OPS01001 | Outside Equipment Operator Rounds | 18 |
| OTA-RK-00016, Addendum 19E | NB01 Bus Degraded Voltage | 1 |
| OTA-RK-00016, Addendum 22E | NB02 Bus Degraded Voltage | 1 |
| OTA-RK-00018, Addendum 48A | Containment Spray Pump Trouble | 2 |
| OTA-RK-00018, Addendum 49A | Safety Injection Pump Trouble | 2 |
| OTA-RK-00020, Addendum 51B | CCW Pump A/C Trouble | 3 |
| OTA-RK-00020, Addendum 53B | CCW Pump B/D Trouble | 2 |
| OTA-RK-00020, Addendum 55B | ESW Pump Trouble | 2 |
| OTA-RK-00060, Addendum 129A | Motor Driven Auxiliary Feedwater Pump A Trouble | 2 |
| OTN-MD-00001 | Switchyard Breakers and Disconnects | 28 |
| OTN-MD-00001, Addendum 1 | Operation of MDV41 and Its Disconnects | 14 |
| OTO-ZZ-00012 | Severe Weather | 33 |
| PM1002576 | Thermography Inspection – Disconnect Switch MDV45A | |

Callaway Action Requests

| | | | | | |
|---|---|---|---|---|---|
| 201201245 | 201201652 | 201205441 | 201207347 | 201309622 | 201501587 |
| 201502100 | 201502416 | 201502802 | 201504475 | 201504539 | 201505233 |
| 201505530 | 201505763 | 201506093 | 201505185 | 201505225 | 201505322 |
| 201505754 | 201506127 | 201506141 | 201506368 | 201506405 | 201506501 |
| 201506518 | 201506720 | 201506749 | 201506848 | 201506876 | 201506926 |
| 201506977 | 201506993 | 201507285 | 201507324 | 201507779 | 201508325 |
| 201508435 | 201508937 | 201600043 | 201600227 | 201600623 | 201606861 |
| 201606986 | 201607019 | 201609296 | | | |

10 CFR 72.48/50.59 Screens/Evaluations Reviewed

| | | | |
|---|---|---|---|
| MP 13-0039 | MP 16-0003 | MPM-KE-QH001 | MP 14-0014 |

Miscellaneous

| Numbers | Title | Date |
|---|---|---|
| | Cycle 12-1 Training Kickoff/Ops Mgr. OE | |
| | ISFSI Onsite Area Monitoring Dose and Dose Rate for 2015 | |
| | 10 CFR 72.212 Evaluation Report Callaway Plant, Unit 1 Dry Fuel Storage System for Spent Nuclear Fuel Docket Number 72-1045 | 0 and 1 |
| | Job 15004747.500 – 72.48 Evaluation | |
| 1226 | 72.48 Screening Evaluation (ISFSI Pad Cut Rebar) | 1 |
| AP15009 | Nuclear Oversight Audit of Dry Cask Storage System | January 6, 2016 |
| H210.0001 | VSDS Standard Map Survey | October 20, 2016 |
| MP 13-0039 | Cask Handling Crane Upgrade – 50.59 Screen | 000.10 |
| MP 14-0014 | Dry Fuel Storage Licensing and Operations Documentation – Applicability Determination | 0 |
| MP 14-0014 | Dry Fuel Storage Licensing and Operations Documentation – 50.59 Screen | 0 |
| MP 14-0014 | Dry Fuel Storage Licensing and Operations Documentation – 50.59 Screen (Heavy Loads Review) | 0 |
| MP 14-0014 | Dry Fuel Storage Licensing and Operations Documentation – 72.48 Evaluation | 0 |
| MP 14-0014 | Dry Fuel Storage Licensing and Operations Documentation – 72.48 Screen | 0 |
| MP 16-0003 | Enhancements to Modified Cask Handling Crane – 50.59 Screen | 0 |
| MP 16-0003 | Enhancements to Modified Cask Handling Crane – Applicability Determination | 0 |
| MPM-KE-QH001 | Cask Handling Crane Inspection – Applicability Determination | 6 |
| MPM-KE-QH001 | Cask Handling Crane Inspection – 72.48 Screen | 6 |
| RO | Reactor Operator Rounds – Multiple Dates | |

| | | |
|---|---|---|
| ULNRC-05926 | 90-Day Response to NRC Bulletin 2012-01, “Design Vulnerability in Electric Power System” | October 24, 2012 |
| ULNRC-06075 | Response to Request for Additional Information Regarding Response to Bulletin 2012-01, “Design Vulnerability in Electric Power System” | January 30, 2014 |

## PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, Control Number 31500011. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

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**Information Request**
**January 4, 2017**
**Notification of Inspection and Request for Information**
**Callaway Plant**
**NRC Inspection Report 05000483/2017001**

INSPECTION DOCUMENT REQUEST

Inspection Dates: February 6th, 2017 (Approximate Date)
Inspector: Eduardo Uribe

Documents Requested:

1. Response to NRC Bulletin 2012-01

2. Corrective action documents (in full detail) of the interim corrective actions

3. Corrective action documents (in summary) of the final corrective actions (for my awareness)

4. Any supporting documents for those interim corrective actions (e.g. Ops Procedures, Maintenance Procedures, Work Orders, and/or Updated Training Modules).

The following items are requested for the
Occupational/Public Radiation Safety Inspection
Callaway Nuclear Power Plant
February 27 through March 3, 2017
Integrated Report 2017001

Inspection areas are listed in the attachments below.

Please provide the requested information on or before January 24, 2017.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.0**1** should be in a file/folder titled "**1**- A," applicable organization charts in file/folder "**1**- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact Martin Phalen at (817) 200-1158 or martin.phalen@nrc.gov.

**PAPERWORK REDUCTION ACT STATEMENT**

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

**5. Radiation Monitoring Instrumentation (71124.05)**
Date of Last Inspection: July 13 – 17, 2015

A. List of contacts and telephone numbers for the following areas:

1. Effluent monitor calibration
2. Radiation protection instrument calibration
3. Installed instrument calibrations
4. Count room and Laboratory instrument calibrations

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:

1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
2. Installed radiation monitors

D. Procedure index for:

1. Calibration, use and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.
2. Calibration of installed radiation monitors

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.

1. Calibration of portable radiation detection instruments (for portable ion chambers)
2. Whole body counter calibration
3. Laboratory instrumentation quality control

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:

1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, whole body counters,
2. Installed radiation monitors,
3. Effluent radiation monitors
4. Count room radiation instruments

NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. Offsite dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements.

H. Current calibration data for the whole body counter’s.

I. Primary to secondary source calibration correlation for effluent monitors.

J. A list of the point of discharge effluent monitors with the two most recent calibration dates and the work order numbers associated with the calibrations.

K. Radiation Monitoring System health report for the previous 12 months

**6. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)**
Date of Last Inspection: July 13 – 17, 2015

A. List of contacts and telephone numbers for the following areas:

1. Radiological effluent control
2. Engineered safety feature air cleaning systems

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:

1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas

1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.

1. Sampling of radioactive effluents
2. Sample analysis
3. Generating radioactive effluent release permits
4. Laboratory instrumentation quality control
5. In-place testing of HEPA filters and charcoal adsorbers
6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:

1. Radioactive effluents
2. Effluent radiation monitors
3. Engineered Safety Feature Air cleaning systems

NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. 2015 and 2016 Annual Radioactive Effluent Release Report, or the two most recent reports.

H. Current Copy of the Offsite Dose Calculation Manual

I. Copy of the 2015 and 2016 inter-laboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results.

J. Effluent sampling schedule for the week of the inspection

K. New entries into 10 CFR 50.75(g) files since date of last inspection

L. Operations department (or other responsible dept.) log records for effluent monitors removed from service or out of service

M. Listing or log of liquid and gaseous release permits since date of last inspection

N. A list of the technical specification-required air cleaning systems with the two most recent surveillance test dates of in-place filter testing (of HEPA filters and charcoal adsorbers) and laboratory testing (of charcoal efficiency) and the work order numbers associated with the surveillances

O. System Health Report for radiation monitoring instrumentation. Also, please provide a specific list of all effluent radiation monitors that were considered inoperable for 7 days or more since November 2011. If applicable, please provide the relative Special Report and condition report(s).

P. A list of all radiation monitors that are considered §50.65/Maintenance Rule equipment.

Q. A list of all significant changes made to the Gaseous and Liquid Effluent Process Monitoring System since the last inspection. If applicable, please provide the corresponding UFSAR section in which this change was documented.

R. A list of any occurrences in which a non-radioactive system was contaminated by a radioactive system. Please include any relative condition report(s).

**7. Radiological Environmental Monitoring Program (71124.07)**
Date of Last Inspection: July 13 – 17, 2015

A. List of contacts and telephone numbers for the following areas:

1. Radiological environmental monitoring
2. Meteorological monitoring

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:

1. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
2. Environmental TLD processing facility
3. Meteorological monitoring program

D. Procedure index for the following areas:

1. Radiological environmental monitoring program
2. Meteorological monitoring program

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.

1. Environmental Program Description
2. Sampling, collection and preparation of environmental samples
3. Sample analysis (if applicable)
4. Laboratory instrumentation quality control
5. Procedures associated with the Offsite Dose Calculation Manual
6. Appropriate QA Audit and program procedures, and/or sections of the station's QA manual (which pertain to the REMP)

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:

1. Radiological environmental monitoring
2. Meteorological monitoring

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

G. Wind Rose data and evaluations used for establishing environmental sampling locations

H. Copies of the 2 most recent calibration packages for the meteorological tower instruments

I. Copy of the 2015 and 2016 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Offsite Dose Calculation Manual, or the two most recent reports.

J. Copy of the environmental laboratory's inter-laboratory comparison program results for 2015 and 2016, or the two most recent results, if not included in the annual radiological environmental operating report.

K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)

L. Quality Assurance audits (e.g., NUPIC) for contracted services

M. Current NEI Groundwater Initiative Plan and status

N. Technical requirements manual or licensee controlled specifications which lists the meteorological instruments calibration requirements

O. A list of Regulatory Guides and/or NUREGs that you are currently committed to relative to the Radiological Environmental Monitoring Program. Please include the revision and/or date for the committed item and where this can be located in your current licensing basis/UFSAR.

P. If applicable, per NEI 07-07, provide any reports that document any spills/leaks to groundwater since the last inspection

**8. Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)**

Date of Last Inspection: July 13 – 17, 2015

A. List of contacts and telephone numbers for the following areas:

1. Solid Radioactive waste processing
2. Transportation of radioactive material/waste

B. Applicable organization charts (and list of personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials)

C. Copies of audits, department self-assessments, and LERs written since date of last inspection related to:

1. Solid radioactive waste management
2. Radioactive material/waste transportation program

D. Procedure index for the following areas:

1. Solid radioactive waste management
2. Radioactive material/waste transportation

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.

1. Process control program
2. Solid and liquid radioactive waste processing
3. Radioactive material/waste shipping
4. Methodology used for waste concentration averaging, if applicable
5. Waste stream sampling and analysis

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection related to:

1. Solid radioactive waste
2. Transportation of radioactive material/waste

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

G. Copies of training lesson plans for 49CFR172 subpart H, for radwaste processing, packaging, and shipping.

H. A summary of radioactive material and radioactive waste shipments made from date of last inspection to present

I. Waste stream sample analyses results and resulting scaling factors for 2015 and 2016, or the two most recent results.

J. Waste classification reports if performed by vendors (such as for irradiated hardware)

K. A listing of all onsite radwaste storage facilities. Please include a summary *or* listing of the items stored in each facility, including the *total* amount of radioactivity and the *highest* general area dose rate.

L. Training, and qualifications records of personnel responsible for the conduct of radioactive waste processing, package preparation, and shipping. (I.e. Summary Records and copies of applicable Lesson Plans; NOT each individual training record for each individual employee or student.)