UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

August 2, 2012

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

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT NUMBER 05000483/2012003

Dear Mr. Heflin:

On June 26, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. The enclosed inspection report documents the inspection results which were discussed on June 27, 2012, with Mr. L. Graessle, Director, Plant Support, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

One NRC-identified finding and one self-revealing finding of very low safety significance (Green) were identified during this inspection. Both of these findings were determined to involve violations of NRC requirements. Further, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating these violations as non-cited violations consistent with Section 2.3.2 of the Enforcement Policy.

If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, and the NRC Resident Inspector at the Callaway Plant.

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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the

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Sincerely,

/RA/

Neil O'Keefe, Chief
Project Branch B
Division of Reactor Projects

Docket Nos.: 05000483
License Nos: NPF-30

Enclosure: Inspection Report 05000483/2012003
w/ Attachment: Supplemental Information

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SRI:DRP	RI:DRP	SPE:DRP	C:DRS/EB1	C:DRS/EB2	C:DRS/OB
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000483
License:	NPF-30
Report:	05000483/2012003
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O
Dates:	March 28 through June 26, 2012
Inspectors:	T. Hartman, Senior Resident Inspector Z. Hollcraft, Resident Inspector D. Dumbacher, Senior Resident Inspector K. Clayton, Senior Operations Engineer N. Makris, Project Engineer
Approved By:	N. O'Keefe, Chief, Project Branch B Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000483/2012003; 03/28-06/26/2012; Callaway Plant Integrated Resident and Regional Report; Flood Protection Measures and Operability Evaluations and Functionality Assessments.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. Two Green non-cited violations of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The cross-cutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding for failure to ensure that a system credited in the Final Safety Analysis Report for mitigating internal flooding was available and reliable. On May 1, 2012, the licensee discovered the floor drains in the engineered safety feature switchgear rooms for both trains were almost completely plugged from debris and were not capable of passing water at the credited flow rate. This was a result of failure to perform inspections or preventive maintenance on the system since original construction. In May 2005, the NRC issued Information Notice 2005-11 regarding, in part, internal flooding and blocked floor drains. Title 10 of the Code of Federal Regulations 50.65(a)(3) states, in part, that "evaluations shall take into account, where practical, industry-wide operating experience. Adjustments shall be made. . ." Contrary to the above, in 2005, the licensee evaluated, but did not take action on applicable industry-wide operating experience. In response, the licensee cleaned the drains, created preventive maintenance tasks to verify proper floor drain operation, and was evaluating the planned corrective actions to address the violation. These were documented in Callaway Action Requests 201203302 and 201204582.

  The inspectors determined that failure to ensure a system credited in the Final Safety Analysis Report was available and reliable to mitigate internal flooding was a performance deficiency. Specifically, the licensee failed to perform preventive maintenance or testing to ensure the engineered safety feature switchgear room floor drains would drain water from the switchgear rooms for both trains at the rate credited for flood mitigation. The inspectors evaluated the performance deficiency in accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening." This performance deficiency was more than minor because it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. During a Phase 1 screening for significance the

inspectors determined the finding was potentially risk significant due to its contribution to a flooding initiating event. It was referred to a senior reactor analyst who determined that because the delta core damage frequency was less than 1E-6 and the finding was not a significant contributor to the large early release frequency, the finding was of very low safety significance. This finding does not have a cross-cutting aspect because the performance deficiency is not representative of current licensee performance. (Section 1R06)

- Green. The inspectors reviewed a self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, involving the licensee's failure to properly assess the operability of component cooling water train A when voids were recognized during a post-maintenance run. On March 19, 2012, when component cooling water pump A was started following maintenance, a large void was discovered in the system. Operators diagnosed that voids had been introduced into the system during the restoration of the spent fuel pool train A heat exchanger. Operators declared the system operable based on seeing pump flows and current readings return to normal values; however, several hours later, the licensee discovered that voids were still present in the system and declared the system inoperable. After extensive venting, the licensee declared the system operable based on an acceptable, measurable quantity of voiding in the system. This issue was entered into the licensee's corrective action program as Callaway Action Request 201203506.

  Failure to fully assess a degraded condition before declaring component cooling water system train A operable was a performance deficiency. This finding is more than minor because it is associated with the human performance attribute of the Mitigating Systems Cornerstone and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems to respond to initiating events. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because it did not create a loss of system safety function of a single train for greater than the technical specification allowed outage time and did not affect seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience component because the licensee failed to institutionalize operational experience through changes to station processes, procedures and training programs to support plant safety [P.2(b)]. (Section 1R15)

B. Licensee-Identified Violations

A violation of very low safety significance that was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and associated Callaway action request number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Callaway operated at 100 percent power for the duration of the inspection period with the exception of planned power reductions for routine surveillance testing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Summer Readiness of Offsite and Alternate-ac Power Systems

a. Inspection Scope

The inspectors performed a review of preparations for summer weather for selected systems, including conditions that could lead to loss-of-offsite power and conditions that could result from high temperatures. The inspectors reviewed the procedures affecting these areas and the communications protocols between the transmission system operator and the plant to verify that the appropriate information was being exchanged when issues arose that could affect the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the transmission system operator and the plant's operations personnel during off-normal or emergency events
- The explanations for the events
- The estimates of when the offsite power system would be returned to a normal state
- The notifications from the transmission system operator to the plant when the offsite power system was returned to normal

During the inspection, the inspectors focused on plant-specific design features and the procedures used by plant personnel to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Final Safety Analysis Report and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- June 4, 2012, startup transformer when control power was lost and forced cooling was unavailable

- June 6, 2012, emergency diesel generator B when the room cooling fan failed to start

These activities constitute completion of one readiness for summer weather affect on offsite and alternate-ac power sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- May 15, 2012, safety injection accumulator fill system
- May 22, 2012, switchyard during breaker MDV85 maintenance
- May 31, 2012, component cooling water train A system
- June 13, 2012, emergency diesel generator train B air start system

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Final Safety Analysis Report, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On April 16, 2012, the inspectors performed a complete system alignment inspection of the ultimate heat sink system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment lineups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- May 1, 2012, residual heat removal train B pump room, fire area A-4
- May 24, 2012, essential switchgear rooms 3301 and 3302, fire areas C-9 and C-10
- June 6, 2012, reactor building area outside the bio-shield wall, fire areas RB-2, RB-3, RB-4, RB-7, and RB-8.

- June 13, 2012, emergency diesel generator train B room, fire area D-2
- June 20, 2012, switchyard control building, fire area S-15

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- April 16, 2012, essential service water train A underground cable vault, Job 12502508

- May 3, 2012, engineered safety feature switchgear rooms
- May 8, 2012, essential service water train B underground cable vault, Job 12502509

These activities constitute completion of one flood protection measures inspection sample and one bunker/manhole sample as defined in Inspection Procedure 71111.06-05.

b. Findings

Introduction. The inspectors identified a Green finding for failure to ensure that a system credited in the Final Safety Analysis Report was available and reliable to mitigate internal flooding. This finding has an associated non-cited violation of 10 CFR 50.65(a)(3).

Description. On May 1, 2012, while performing fire system testing, the licensee discovered that the floor drains in the engineered safety feature switchgear rooms for both trains were not draining properly. After an investigation it was determined that the floor drains were almost completely plugged by debris and were not capable of passing water at the credited flow rate. Chapter 9.3.3 of the Final Safety Analysis Report credited these drains for flood mitigation. The drains must remove water from the switchgear rooms and transfer it to the sump where sump high level alarms should alert control room operators. The operators are required to identify and take action to terminate the flooding within thirty minutes in order to prevent the water level from rising to the point where safety-related equipment could fail. The licensee initiated compensatory actions by stationing a continuous watch to alert the control room in case of flooding and take actions to drain the water via other means.

In May 2005, the NRC issued Information Notice 2005-11, "Internal Flooding/Spray-down of Safety Related Equipment Due to Unsealed Equipment Hatch Floor Plugs and/or Blocked Floor Drain," regarding, in part, internal flooding and blocked floor drains. This was documented as operating experience in Callaway Action Request 200502989. This action request was determined to be applicable to Callaway, was closed with a note that the floor drains were not scoped into the Maintenance Rule, and no action was needed or taken.

A review of Callaway's current Maintenance Rule program identified that this series of floor drains was included in the scoped systems as part of the oily waste system. This system had some functions that were within the scope of the Maintenance Rule and some functions that were not. A function was identified that ensures wastewater can be transferred from one location to another. However, this function was not included in the Maintenance Rule scope.

The inspectors noted that 10 CFR 50.65(a)(3) states, in part, that performance and condition monitoring activities and preventive maintenance activities shall be evaluated at least every refueling cycle. The evaluations shall take into account, where practical, industry-wide operating experience. Adjustments shall be made where necessary to

ensure that the objective of preventing failures of structures, systems, and components through maintenance is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components due to monitoring or preventive maintenance. However, since 2005 the licensee's Maintenance Rule program evaluations had failed to take into account Information Notice 2005-11 as applicable industry-wide operating experience, and as a result, failed to make adjustments where necessary to prevent failures of structures, systems, and components. The inspectors concluded that, while the licensee had not originally identified the flood mitigation function of the floor drain system to be within scope of the Maintenance Rule, the periodic evaluations of pertinent industry operating experience should have caused the licensee to recognize the need for maintenance actions as well as to consider the function for inclusion in the Maintenance Rule program.

Analysis. The inspectors determined that the failure to ensure that a system credited in the Final Safety Analysis Report was available and reliable to mitigate internal flooding was a performance deficiency. Specifically, the licensee failed to perform preventive maintenance or testing to ensure the engineered safety feature switchgear room floor drains would drain water from the switchgear rooms for both trains at the rate credited for flood mitigation. This performance deficiency was similar to Example 7.d in Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues." The finding was more than minor because it impacted the protection against external events attribute of the Mitigating Systems Cornerstone, and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was evaluated using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Mitigating Systems Cornerstone. The inspectors answered yes to question 5 and determined that the finding needed an evaluation in accordance with Inspection Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The finding was potentially risk significant due to a flooding initiating event, in that it would degrade one or more trains of a system that supports a safety system or function. A senior reactor analyst determined that the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Callaway Station," Revision 2.01a, did not include the room drain system. Therefore, the analyst performed a bounding Phase 3 significance determination.

Potential flooding sources in the switchgear rooms were essential service water and fire protection piping. Inspectors bounded the amount of piping as being no more than 100 feet per system. The analyst then calculated the frequency (λ) of a piping break. NUREG/CR-6928, "Industry Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants," dated February 2007, specified the following frequencies for piping failures.

Essential service water (small leaks) – 3.0E-10/ft-hr

Nonessential service water (small leaks) – 1.15E-10/ft-hr

The analyst used the frequency for small leaks because it was higher and thus more bounding for this analysis. Since the exposure period was one full year, and the piping

lengths were assumed to be 100 feet each, the frequency for piping leaks in one of the switchgear rooms was:

λ = (100ft * 3E-10/ft-hr * 8760hrs/yr) + (100ft * 1.15E-10/ft-hr * 8760 hrs/yr)

λ = 3.6E-4/yr

Next, the analyst used the Callaway Standardized Plant Analysis Risk model, Revision 8.15 to calculate the conditional core damage probability assuming one entire switchgear bus was rendered inoperable and nonfunctional by a piping failure combined with the clogged drains. In this case, the analyst set the basic event for bus NB01 to 1.0. The conditional core damage probability was 1.5E-4. The baseline core damage probability was 9E-6. Therefore, the incremental core damage probability was still 1.5E-4. The change to the core damage frequency (delta-CDF) was:

Delta-CDF = 3.6E-4 * 1.5E-4 = 5.4E-8 per room

Since there were two switchgear rooms, the total change to the core damage frequency was:

Delta-CDF = 2 * 5.4E-8 = 1.1E-7

The dominant core damage sequences included loss of one bus of safety related switchgear. The significance was limited by the relatively small frequency of piping breaks in the affected area.

External Events Analysis: The analyst reviewed the Callaway, "Individual Plant Examination of External Events," dated June 30, 1995 to determine the contribution of external events to delta-CDF. The analyst noted that high winds (including tornados), floods and transportation accidents were screened from the analysis, as the licensee met the 1975 Standard Review Plan screening criteria. Accordingly, the analyst did not consider these areas further. The analyst also noted that seismic and fire initiators were not significant drivers of small and medium loss of coolant accidents. Therefore, external events were not significant contributors to this risk associated with this finding.

Large Early Release Frequency: To evaluate the change to the large early release frequency, the analyst used Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process." Callaway has a large dry containment. The finding screened as having very low safety significance for large early release frequency because it did not affect the intersystem loss of coolant accident or steam generator tube rupture categories.

Because the delta-CDF was less than 1E-6 and the finding was not a significant contributor to the large early release frequency, the finding was of very low safety significance (Green).

This finding does not have a cross-cutting aspect because the performance deficiency is not representative of current licensee performance.

Enforcement. Title 10 of the Code of Federal Regulations 50.65(a)(3) states, in part, that performance and condition monitoring activities and preventive maintenance activities shall be evaluated at least every refueling cycle. The evaluations shall take into account, where practical, industry-wide operating experience. Adjustments shall be made where necessary to ensure that the objective of preventing failures of structures, systems, and components through maintenance is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components due to monitoring or preventive maintenance. Contrary to the above, since 2005, the licensee failed to take into account applicable industry-wide operating experience during required evaluations of performance and condition monitoring and preventive maintenance activities, and as a result, failed to make adjustments where necessary to prevent failures of structures, systems, and components. Specifically, the licensee evaluated Information Notice 2005-11, "Internal Flooding/Spray-down of Safety Related Equipment Due to Unsealed Equipment Hatch Floor Plugs and/or Blocked Floor Drain," and inappropriately concluded that no changes to monitoring or preventive maintenance were necessary However, the failure to inspect or perform maintenance allowed the floor drain system to build up dirt and debris until the system was unable to perform its flood mitigation function in both engineered safety feature switchgear rooms. The licensee cleaned the drains and created preventive maintenance tasks to verify proper floor drain operation. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as Callaway Action Requests 201203302 and 201204582, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000483/2012003-01, "Failure to Incorporate Operating Experience for a 10 CFR 50.65(a)(3) Assessment."

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

.1 Quarterly Review of Licensed Operator Requalification Program

a. Inspection Scope

On May 21 and 29, 2012, the inspectors observed a crew of licensed operators in the plant's simulator during requalification testing. The inspectors assessed the following areas:

- Licensed operator performance
- The ability of the licensee to administer the evaluations
- The modeling and performance of the control room simulator
- The quality of post-scenario critiques
- Follow-up actions taken by the licensee for identified discrepancies

Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings were identified.

.2 Quarterly Observation of Licensed Operator Performance

a. Inspection Scope

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

- April 6, 2012, response to an immovable control rod
- April 10, 2012, loss of normal charging pump and annunciators
- May 10, 2012, automatic start of alternate emergency power supply diesels due to undervoltage signal

In addition, the inspectors assessed the operators' adherence to plant procedures, including conduct of operations procedure and other operations department policies. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- Emergency diesel generator train B jacket water heater, Callaway Action Request 201110797
- Normal service water pump C trip, Callaway Action Request 201202089

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices

- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance monitoring
- Charging unavailability for performance monitoring
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- April 10, 2012, emergency diesel generator train B, ultimate heat sink train B, and essential service water train B outage, Jobs 10515807, 10515799, and 11506022
- April 17, 2012, component cooling water train A and centrifugal charging pump train A planned maintenance, Job 06528604

- April 25, 2012, emergency diesel generator train A, ultimate heat sink train A, and essential service water train A outage, Job 11003463

- May 22, 2012, turbine-driven auxiliary feed water pump plant maintenance outage, Job 11501434

- June 5, 2012, emergency service water train B temperature switch conduit failure, Job 12002944

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed the following assessments:

- March 22, 2012, voids identified in component cooling water train A, Callaway Action Request 201202157

- April 19, 2012, centrifugal charging pump A discharge isolation valve worm gear different than documented design, Callaway Action Request 201202867

- May 1, 2012, engineered safety feature switchgear room trains A and B floor drains clogged, Callaway Action Request 201203302

- May 25, 2012, ultimate heat sink cooling tower trouble alarm, Callaway Action Request 201203739

- June 6, 2012, emergency diesel generator train B room fan failed to start, Callaway Action Request 201204094

The inspectors selected these operability and functionality assessments based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure technical specification operability was properly justified and to verify the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Final Safety Analysis Report to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five operability evaluations inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

Introduction. The inspectors reviewed a Green self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the licensee's failure to properly assess the operability of component cooling water train A after voids were recognized during a post-maintenance run.

Description. On March 19, 2012, with the Callaway Plant at full power, the component cooling water side of the train A spent fuel pool heat exchanger was isolated and drained for planned maintenance. Operators noted that component cooling water surge tank level was lowering as the heat exchanger was being drained. This indicated that the isolation valves were leaking past their seats. The heat exchanger work was discontinued and its vents and drains were closed. On March 21, operators vented and filled the heat exchanger as part of system restoration. Due to unexpected valve seat leakage, a large quantity of air was introduced into the component cooling water system. When the component cooling water train A pump was started, the void shifted to the suction of the pump causing a low discharge pressure. Pump C automatically started as designed. Once discharge pressures and pump motor amps returned to normal, operators stopped pump C. Based on noting a 10 percent drop in surge tank level, operators diagnosed that voids had been introduced into the system during the restoration of the spent fuel pool train A heat exchanger.

Following an immediate operability determination conducted per licensee Procedure APA-ZZ-0500, Appendix 1, operators declared component cooling water train A operable based on restoration of normal pump flows and current readings. Several hours later, the licensee stopped pump A and noted a 4 percent increase in surge tank level. This indicated that voids were still present in the system. Since operators did not know the size or location of the voids, and no criteria for an acceptable

void volume in the component cooling water system existed at the time, a second operability determination was performed, and operators declared the system inoperable. The licensee entered Technical Specification 3.7.7, "Component Cooling Water System," Condition A, a 72-hour shutdown action statement.

Operating experience from another nuclear power plant documented in Callaway Action Requests 201005424 and 201005587 demonstrated that voids can remain entrained in the system even while a pump is running. Due to the system piping arrangement, not all voids can be vented to the surge tank. When load shedding and emergency load sequencing it is possible to shift those voids to the suction of the pump and cause damage. This operating experience also helped to identify that no acceptance criteria for voids in the component cooling water system existed at Callaway. Corrective actions failed to ensure that a calculation for acceptable voids was completed so that when this event occurred, operators were not prepared to consider the effects of the degraded condition. Due to this, operators incorrectly assumed that as long as the pump appeared to be running normally, then the system was operable.

Analysis. Failure to fully assess a degraded condition before declaring component cooling water system train A operable was a performance deficiency. This finding is more than minor because it is associated with the human performance attribute of the Mitigating Systems Cornerstone and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems to respond to initiating events. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding is determined to be of very low safety significance because it did not create a loss of system safety function of a single train for greater than the technical specification allowed outage time and did not affect seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience component because the licensee failed to institutionalize operational experience through changes to station processes, procedures, and training programs to support plant safety [P.2(b)].

Enforcement. Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Callaway Procedure APA-ZZ-0500, Appendix 1, “Operability and Functionality Determinations,” Revision 15, a procedure affecting quality, step 4.1.1, required operators to consider the “effect or potential effect of the degraded or nonconforming condition on the affected SSC’s ability to perform specified safety functions” when performing an operability determination. Contrary to this, on March 21, 2012, the licensee did not perform an activity affecting quality in accordance with documented instructions, procedures, or drawings. Specifically, operators declared component cooling water train A operable without considering the potential affect of unquantified voids in the system, resulting in the system being declared operable when it should not have been for approximately a 7-hour period. Once it was discovered that the voids were still present, the licensee declared the

system inoperable and performed extensive venting to restore operability. Because this finding is of very low safety significance and was entered into the licensee's corrective action program as Callaway Action Request 201203506, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000483/2012003-02, “Failure to Declare Component Cooling Water Train A Inoperable Due to Voids.”

1R18 Plant Modifications (71111.18)

Permanent Modifications

a. Inspection Scope

On March 28, 2012, the inspectors reviewed key affected parameters associated with energy needs, materials, replacement components, timing, control signals, equipment protection from hazards, operations, process medium properties, licensing basis, and failure modes for the permanent modification identified as Modification Package 01-1010, "74 Status Relay Change Out."

The inspectors verified that modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; post-modification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur; systems, structures and components’ performance characteristics still meet the design basis; the modification design assumptions were appropriate; the modification test acceptance criteria will be met; and licensee personnel identified and implemented appropriate corrective actions associated with permanent plant modifications. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample for permanent plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

One licensee identified finding related to this permanent modification is discussed in Section 4OA7 of this report.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- March 28, 2012, technical support center diesel generator post-maintenance test, Job 12501635

- April 13, 2012, containment cooler B and D modification post-maintenance test, Jobs 12001688 and 12001687

- April 25, 2012, ultimate heat sink fan modification post-maintenance test, Job 11003463

- May 17, 2012, containment spray pump A post-maintenance test, Jobs 10007062, 10008493, 10008487, and 11005164

- May 23, 2012, turbine-driven auxiliary feedwater pump governor valve test, Job 11501436

- June 20, 2012, emergency diesel generator B room fan motor replacement test, Job 11004803

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following:

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed

- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the Final Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six post-maintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R21 Component Design Basis Inspection Follow-up (71111.21)

125 VDC Battery NK11

a. Inspection Scope

On December 5, 2008, the triennial Component Design Basis Inspection Report 05000483/2008008 documented an Unresolved Item (URI) regarding the adequacy of the battery service test for safety-related battery NK11 (and NK14, effectively). The inspection team generated a Task-Interface Agreement (TIA 2009-002) for resolution of the issue and after an initial answer decided to review the case in greater detail. The final response to the Task-Interface Agreement was completed on April 26, 2012, and was documented in TIA 2011-014 closure memorandum, docketed in ADAMS as ML12109A349. Specific documents reviewed during this inspection are listed in the attachment.

b. Observations and Findings

(Closed) Unresolved Item 05000483/2008008-04, "Adequacy of the NK11 Battery Service Test"

During the period of time that the Task-Interface Agreement was in review, Callaway Plant updated the battery sizing calculation to extend out to the 240 minute load profile. The maintenance procedures were also updated to include testing to the new load profile, which is a combined testing profile that encompasses both the loss of offsite power and loss of coolant accident profiles (LOOP/LOCA). The licensee's LOOP/LOCA testing requirements in the updated safety analysis report are a 200 minute requirement, while the station blackout profile has a 240 minute requirement. In either scenario, there is a peak at the end of the load profile (that actuates relays, closes breakers, etc.) that restores site power and re-energizes the battery chargers. During the licensee's service test they simulate this final peak both before the 200 minute mark and again before the 240 minute mark, so that both are accounted for in the testing regime.

The NRC concluded in the Task-Interface Agreement response that testing to the station blackout profile as part of the technical specifications was not required. However, all of the nuclear plants in the Unites States were informed after this rule was passed that they should be testing the batteries to the most limiting conditions that the batteries would experience. Callaway did not do this until it was pointed out by the component design basis inspection team in 2008 that it was a potential concern. However, this was not a regulatory requirement for the station and therefore this unresolved item is closed.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning

- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- April 15, 2012, leak check essential service water/service water train B cross-connects, Job 10514529
- May 1, 2012, residual heat removal train B pump inservice test, Job 12501537
- May 10, 2012, emergency diesel train B fuel oil storage tank surveillances, Job 12504175
- May 14, 2012, combined charging pump train A routine test and solid state protection system slave relay test of train phase A and B actuation sequence, Job 12501929
- May 21, 2012, routine test of train A auxiliary feedwater discharge valves, Job 12502204
- June 14, 2012, reactor coolant system leakage surveillance, Job 12506373

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of a total of six surveillance testing inspection samples, specifically one reactor coolant leak rate, one inservice test, and four routine surveillances as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators involving an earthquake on April 17, 2012, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

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 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the first Quarter 2012 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, “Performance Indicator Program.”

This review was performed as part of the inspectors’ normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period from the second quarter 2011 through the first quarter 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6, and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee’s operator narrative logs, operability assessments, Maintenance Rule records, maintenance work orders, issue reports, event reports, and NRC integrated inspection reports for the period of April 2011 through March 2012 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one safety system functional failures sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Heat Removal System (MS08)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - heat removal system performance indicator for the period from the second quarter 2011 through the first quarter 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, mitigating systems performance index derivation reports, and NRC integrated inspection reports for the period of April 2011 through March 2012 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index - heat removal system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Reactor Coolant System Leakage (BI02)

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system leakage performance indicator for the period from the second quarter 2011 through the first quarter 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports, and NRC integrated inspection reports for the period of April 2011 to March 2012 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one reactor coolant system leakage sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of January 2012 through June 2012 although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Observations and Findings

The inspectors found that the licensee identified the following trends of significance:

- Callaway Action Request 201110756, training request identifies an adverse condition with no Callaway Action Request written
- Callaway Action Request 201200518, emerging trend in inadequate job preparation throughout the organization
- Callaway Action Request 201201302, trend in exam compromise and exam compromise near misses
- Callaway Action Request 201203576, negative trend in "stop when unsure" behaviors

Inspectors noted that these trends have contributed to violations documented by the NRC in the last year. Inspectors reviewed the licensee's characterization of the trends and their causes for accuracy and will monitor the corrective actions for effectiveness.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting drains in the engineered safety feature switchgear rooms were not draining properly, Callaway Action Request 201203302. The inspectors reviewed the licensee's engineering evaluation of the condition and the actions taken in accordance with technical specifications.

This activity constitutes completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

(Closed) Licensee Event Report 05000483/2012-001-00, "Modification Implementation Error Adversely Impacted the Containment Cooling System"

On March 28, 2012, during a modification to replace a control relay for containment coolers train A, the licensee determined that the procedure would have disabled the ability for the fans to restart in slow speed following a design basis accident if the fans had previously been running in fast speed. This would cause the system to become inoperable. The licensee determined that the same cause had rendered containment coolers train B inoperable on March 16, resulting in a loss of safety function of the containment cooler system while train A coolers were removed from service. This design flaw was originally discovered and documented in Licensee Event Report 2008-001, "Inadequate Analysis Results in a Component Cooling Water Train Declared Inoperable," and a modification was performed to correct it in 2008. The cause was attributed to poor communication and work controls processes during modifications. License Event Report 2012-001-00, "Modification Implementation Error Adversely Impacted the Containment Cooling System," was submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by technical specifications and 10 CFR 50.73(a)(2)(v)(D) as a safety system functional failure. The resident inspectors reviewed the licensee's submittal and determined that the report adequately documented the event including the potential safety consequences and necessary corrective actions. Enforcement aspects associated with this license event report are discussed in Section 4OA7. No additional violations were identified during the inspectors' review. This license event report is closed.

4OA5 Other Activities

Follow Up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period (92723)

a. Inspection Scope

The inspectors performed Inspection Procedure 92723, "Follow Up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period," in accordance with the assessment letter dated September 1, 2011 (ML112440177). Callaway received four Severity Level IV violations in the traditional enforcement area of "impeding the regulatory process," during the period between July 2010 and June 2011. The inspectors reviewed the licensee's corrective action documents for each violation and the overall cause analysis for the following items:

- Problem identification
- Cause, extent of condition and extent of cause
- Evaluation of corrective actions

b. Findings and Observations

No findings were identified. The inspectors determined that the licensee properly identified the problem and causes using a systematic approach and that missed opportunities were identified. The evaluation adequately addressed the extent of condition and extent of cause. Corrective actions taken or planned were appropriate to address the causes, and a schedule and measures of success for these actions were established.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 27, 2012, inspectors presented the inspection results of the follow-up inspection for the four traditional enforcement violations to Mr. Heflin, Senior Vice President and Chief Nuclear Officer, and other members of the licensee staff. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On June 21, 2012, the inspector presented the inspection results of the follow-up inspection for the unresolved item with Mr. S. Petzel, Engineer, Regulatory Affairs, on June 21, 2012. He acknowledged the findings presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified as part of this review.

On June 27, 2012, the inspectors presented the inspection results to Mr. L. Graessle, Director, Plant Support, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors verified that no proprietary information was retained.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation.

Technical Specification 3.6.6, “Containment Spray and Cooling Systems,” requires that two containment cooling trains shall be operable in Modes 1, 2, 3 and 4. Contrary to the above, on March 28, 2012, Callaway workers discovered that a modification procedure for containment coolers train A rendered the system unable to perform its safety-related functions following a design basis accident in adverse conditions. Specifically, it disabled the ability for the fan to start in slow speed following a trip from high speed due to thermal overload under certain accident conditions. The licensee then determined that this modification had disabled the same feature on containment coolers train B on March 16, 2012. This resulted in both trains of containment coolers being inoperable for a period of time. The cause was attributed to poor communication and work controls processes during modifications. The details of this issue are documented in License Event Report 05000483/2012-001-00, "Modification Implementation Error Adversely Impacted the Containment Cooling System." This finding is more than minor because it is associated with the human performance attribute of the Barrier Integrity Cornerstone and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radio nuclide releases caused by accidents or releases. Using Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” inspectors determined that this finding is of very low safety significance because it did not represent an actual open pathway in the physical integrity of reactor containment. This finding was entered in the licensee’s corrective action program as Callaway Action Request 201202333.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

L. Bodenschatz, Maintenance Rule Coordinator
L. Graessle, Director, Plant Support
A. Heflin, Senior Vice President and Chief Nuclear Officer
J. Little, Supervising Engineer, Nuclear Engineering
D. Neterer, Plant Director
S. Petzel, Engineer, Regulatory Affairs
C. Reasoner, Vice President Engineering
A. Schnitz, Engineer, Regulatory Affairs

NRC Personnel

G. Replogle, Senior Reactor Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2012003-01	NCV	Failure to Incorporate Operating Experience for a 10 CFR 50.65(a)(3) Assessment (Section 1R06)
05000483/2012003-02	NCV	Failure to Declare Component Cooling Water Train A Inoperable Due to Voids (Section 1R15)

Closed

05000483/2008-008-04	URI	Adequacy of the NK11 Battery Service Test (Section 1R21)
05000483/2012-001-00	LER	Modification Implementation Error Adversely Impacted the Containment Cooling System (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

NUMBER	TITLE	REVISION
OSP-NB-00001	Class 1E Electrical Source Verification	35
PDP-ZZ-00027	Summer Reliability Program	4

CALLAWAY ACTION REQUESTS

201202708 201204038 201204042

JOBS

11512249	12002902	12002944

Section 1R04: Equipment Alignment

DRAWINGS

NUMBER	TITLE	REVISION
E-U3EF02A	Schematic Diagram Ultimate Heat Sink Cooling Tower Fans	18
E-U3EF02C	Schematic Diagram Ultimate Heat Sink Cooling Tower Fans Manual Control	17
E-U3EF05	Schematic Diagram Cooling Tower Inlet By-pass Valve	19
E-U3EF07	Schematic Diagram Essential Service Water Auxiliary Relays Inlet Cooling Tower Bypass Valves and Annunciators	10
E-U3EF15	Schematic Diagram Miscellaneous Circuits	2
M-U2EF01	Piping and Instrumentation Diagram Essential Service Water System	62
M-22EF01	Piping and Instrumentation Diagram Essential Service Water System	76
M-22EM01	Piping and Instrumentation Diagram High Pressure Coolant Injection	37
M-22EP01	Piping and Instrumentation Diagram Accumulator Coolant Injection	17

CALLAWAY ACTION REQUESTS

201001813	201110229	201104102	201104149	201104335
201200502	201202673	201203085	201203434	201203739
201203761	201203896			

MISCELLANEOUS

NUMBER	TITLE	REVISION
EF-123	Ultimate Heat Sink Thermal Performance Analysis Using GOTHIC 7.2(b) Callaway Action Request 201001813	0
EF-54	Ultimate Heat Sink Thermal Performance Analysis	3
FAI 11-717	Evaluation of the Callaway Gas Intrusion in the Safety Injection Discharge Piping	0

MISCELLANEOUS

NUMBER	TITLE	REVISION
MP 11-0004	Ultimate Heat Sink Temperature Issue Solution	000.3

Section 1R05: Fire Protection

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00703	Fire Protection Operability Criteria and Surveillance Requirements	20
FPP-ZZ-00003	Reactor Building Prefire Strategies	9
FPP-ZZ-00008	Miscellaneous Building Outside Protected Area Prefire Strategies	11

CALLAWAY ACTION REQUESTS

201203835 201204363

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
F170.0006	Transient Combustible Permit for B Emergency Diesel Generator Room	June 13, 2012
060612RBENTRY	Radiation Work Permit for Reactor Building Entry	0
Fire Preplan Manual	Fire Preplan Manual	35

Section 1R06: Flood Protection Measures

PROCEDURES

NUMBER	TITLE	REVISION
EDP-ZZ-01128 Appendix. 1	Systems, Structures, and Components in the Scope of the Maintenance Rule at Callaway	8
EDP-ZZ-01128 Appendix. 4	Maintenance Rule System Functions	7

DRAWINGS

NUMBER	TITLE	REVISION
M-22LE02 (Q)	Piping and Instrument Diagram – Control and Diesel Generator Building Oily Waste System	6

CALLAWAY ACTION REQUESTS

201202989 201203302 201204582

JOBS

12002293 12502508 12502509

MISCELLANEOUS

NUMBER	TITLE	REVISION
	Callaway Plant Housekeeping Standard	2

Section 1R11: Licensed Operator Requalification Program

PROCEDURES

NUMBER	TITLE	REVISION
EIP-ZZ-00101	Classification of Emergencies	47

CALLAWAY ACTION REQUESTS

201203767

MISCELLANEOUS

NUMBER	TITLE	DATE
T61.0810 8	Simulator Exam Scenario Guide DS-37	May 9, 2012
T61.0810 8	Simulator Exam Scenario Guide DS-13	May 11, 2012
T61.0810 8	Simulator Exam Scenario Guide DS-07	May 21, 2012

Section 1R12: Maintenance Effectiveness

PROCEDURES

NUMBER	TITLE	REVISION
EDP-ZZ-01128	Maintenance Rule Program	17

DRAWINGS

NUMBER	TITLE	REVISION
M-22KJ04	Piping and Instrumentation Diagram Standby Diesel Generator B Cooling Water System	24

CALLAWAY ACTION REQUESTS

201110797

JOBS

08001106 04502434

MISCELLANEOUS

NUMBER	TITLE	DATE
	Operator Logs for December 21, 2011	December 21, 2011
201110797	Past Operability Determination for B Emergency Diesel Generator Fire	January 12, 2012
MP 01-1003	Various Breaker Auxiliary Contact Modification	September 30, 2008

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

NUMBER	TITLE	REVISION
EDP-ZZ-01129	Callaway Energy Center Risk Assessment	31
ODP-ZZ-00002	Equipment Status Control	64
OOA-ZZ-SM001	Safety Monitor	5

CALLAWAY ACTION REQUESTS

201109626 201202632 201204038 201204070

JOBS

10515807 10515799 11506022 11003463 06528604

11501434 11006690 12002944

Section 1R15: Operability Evaluations

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00500 Appendix 1	Operability and Functionality Determinations	15
ODP-ZZ-00001	Operations Department - Code of Conduct	8

CALLAWAY ACTION REQUESTS

201202157	201202867	201203302	201203506	201203739
201204295	201204094			

JOBS

12001553	12001562

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
201202157	Initial Operations Review for A Train Component Cooling Water Voiding	March 21, 2012
201202157	Past Operability Determination for A Train Component Cooling Water Voiding	May 11, 2012
201204094	Prompt Operability for B Emergency Diesel Generator Without a Room Fan	0 June 7, 2012
201204094	Prompt Operability for B Emergency Diesel Generator Without a Room Fan	1 June 14, 2012
201204094	Night Order for Maintaining B Emergency Diesel Generator Operability	0 June 7, 2012
201204094	Night Order for Maintaining B Emergency Diesel Generator Operability	1 June 14, 2012
Calculation GM-03	Emergency Diesel Generator Room Steady-State Temperature	1
Calculation M-FL-08	Revised Control Building Flooding	

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
GM-03 Addendum 1	Correction to Generator Heat Load Contribution	1

Section 1R18: Plant Modifications

DRAWINGS

NUMBER	TITLE	REVISION
E-23GN02	Schematic Diagram Containment Cooler Fans A & C	11
E-23GN02	Schematic Diagram Containment Cooler Fans A & C	12
E-23GN02	Schematic Diagram Containment Cooler Fans A & C	14

CALLAWAY ACTION REQUESTS

200802264 201202333

JOBS

10008800 10008818 10009470

Section 1R19: Post-Maintenance Testing

PROCEDURES

NUMBER	TITLE	REVISION
ETP-FC-00001	Calibration of Terry Turbine Governor Valve Actuator	9
OTN-EN-00001	Containment Spray System	20

DRAWINGS

NUMBER	TITLE	REVISION
M-22EN01	Piping and Instrumentation Diagram Containment Spray	16
M-23EN01	Piping Isometric Containment Spray System Auxiliary Building A Train	9

CALLAWAY ACTION REQUESTS

201201851 201203653 201204350

JOBS

10007062	10008487	10008493	11003463	11004803
11005164	11501436	12001687	12001688	12501635

MISCELLANEOUS

NUMBER	TITLE	DATE
5046-12-027	Ultrasonic Test Report for Void Checks in Containment Spray A Piping	May 16, 2012

Section 1R21: Component Design Basis

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
ML101130021	Final Response to Technical Interface Agreement 2009-002	April 28, 2010
ML12109A349	Final response to Technical Interface Agreement 2011 014	April 26, 2012

Section 1R22: Surveillance Testing

PROCEDURES

NUMBER	TITLE	REVISION
CSP-ZZ-07350	Diesel Fuel Oil Testing Program	23
CTP-JE-01230	Diesel Fuel Oil Sampling	43
ISF-SB-0A30A	Solid State Protection System Train A Slave Relay K624, K626, K604, K711, and K743 Test	33
OSP-AL-V001A	Train A Auxiliary Feedwater Valve Inservice Test	49
OSP-BB-00009	Reactor Coolant System Leakage Balance	31
OSP-BG-P005A	Centrifugal Charging Pump A Inservice Test – Group B	42

JOBS

10514529	12501537	12501929	12502204	12504175
12506373				

Section 1EP6: Drill Evaluation

PROCEDURES

NUMBER	TITLE	REVISION
EIP-ZZ-00101	Classification of Emergencies	47

Section 4OA1: Performance Indicator Verification

CALLAWAY ACTION REQUESTS

201109009

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
	Mitigating System Performance Indicator Derivation Report: Heat Removal System Unreliability Index	March 2012
	Callaway Energy Center Mitigating System Performance Indicator Basis Document	9
	Mitigating System Performance Indicator Derivation Report: Heat Removal System Unavailability Index	March 2012
CA2564	NRC Performance Indicator Transmittal Report for Safety System Functional Failures First Quarter 2012	April 3, 2012
CA2565	NRC Performance Indicator Transmittal Report for Mitigating Systems Performance Indicator Fourth Quarter 2011	December 21, 2011
CA2567	NRC Performance Indicator Transmittal Report for Reactor Coolant System Leakage First Quarter 2012	April 9, 2012

Section 4OA2: Identification and Resolution of Problems

CALLAWAY ACTION REQUESTS

201110756 201200518 201201302 201203302 201203576

201203783

JOBS

12002293

MISCELLANEOUS

NUMBER	TITLE	DATE
	Adverse and Emerging Trends Since 2011/12/01	May 30, 2102
CA2982	Pressure Boundary Breach Evaluation Form – Control Building Envelope	May 2, 2012
CA2982	Pressure Boundary Breach Evaluation Form – Control Building Envelope	May 3, 2012
CA2982	Pressure Boundary Breach Evaluation Form – Control Building Envelope	May 9, 2012
	Control Building Filtration/Pressurization/Normal Ventilation Systems (Callaway Flow Values)	
	Graph of Control Building / Control Room Allowable Inleakage Values with Compensatory Actions	
	RADTRAD Analysis to Determine the Effects of Proposed Mitigating Actions for Control Room Building / Control Room Pressure Boundary Breach	June 18, 2012

Section 4OA5: Other Activities

PROCEDURES

NUMBER	TITLE	REVISION
APA-ZZ-00108 Appendix 1	Initiate License Document Change Request	3
APA-ZZ-00108 Appendix 2	Responsibilities for Final Safety Analysis Report Content	0
APA-ZZ-00500	Corrective Action Program	54
APA-ZZ-00500 Appendix 3	Past Operability & Reportability Evaluations	13
APA-ZZ-00500 Appendix 11	Regulatory Issue Summary 2005-20 Degraded and Nonconforming Condition Resolution	6
APA-ZZ-00520	Reporting Requirements and Responsibilities	36
EDP-ZZ-05000	Engineering Product Quality	24
FDP-ZZ-00103	License Document Change Process	6

CALLAWAY ACTION REQUESTS

200802633	200910153	201006086	201009024	201010897

CALLAWAY ACTION REQUESTS

201011132	201101335	201101957	201102136	201102272
201102565	201103142	201103635	201103911	201103985
201106224	201107010			

MISCELLANEOUS

NUMBER	TITLE	DATE
MP-08-0013	Containment Coolers DSGN01A/B/C/D Control Circuit Change	0
	Common Cause Evaluation for Callaway Action Request 201106224	August 18, 2011
	Previously Completed Evaluations and Corrective Actions for Callaway Action Request 201106224	August 18, 2011
	Why Analysis for Callaway Action Request 201106224	August 18, 2011
	Callaway Regulatory Performance Summary 2012Q1	April 5, 2012
	Traditional Enforcement Violation Performance Indicator Summary 2012Q1	April 5, 2012
	Extent of Cause Evaluation for Callaway Action Request 201106224	April 24, 2012
	Callaway Reportability Notebook	April 2, 2012
TRRQ 201010895	Single Failure and Accident Analysis Assumptions	April 5, 2012
TRRQ 201103620	Provide Group Training on Reportability Requirements for Past Operability Determinations	April 5, 2012
	Training Slides for Regulatory Affairs Regional Licensing Briefing	April 5, 2012

MISCELLANEOUS

NUMBER	TITLE	DATE
LER 05000483/2010-010-00	Violation of Technical Specification 3.0.3 Due to 13' Class 1E Electrical Equipment Air Conditioning Unit Inoperability	March 21, 2011
LER 05000483/2009-005-01	Inoperability of Atmospheric Steam Dump Valves	September 29, 2011
LER 05000483/2010-002-00	Anticipatory Motor-Driven Auxiliary Feedwater Actuation Function Rendered Inoperable in Mode 1	April 19, 2010