



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

November 3, 2011

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 05000483/2011004

Dear Mr. Heflin:

On September 23, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. The enclosed integrated inspection report documents the inspection findings, which were discussed on September 26, 2011, with you and other members of your staff.

The inspections 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.

Based on the results of this inspection, the NRC identified two issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that one violation and one finding are associated with these issues. This violation and finding were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>).

If you contest the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the facility. In addition, if you disagree with the cross-cutting aspect assigned to any finding 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.

Union Electric Company

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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 you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

Geoffrey B. Miller, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

Enclosure:
NRC Inspection Report 05000483/2011004
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000483

License: NPF-30

Report: 05000483/2011004

Licensee: Union Electric Company

Facility: Callaway Plant

Location: Junction Highway CC and Highway O

Dates: June 24 through September 23, 2011

Inspectors: D. Dumbacher, Senior Resident Inspector
J. Groom, Resident Inspector
Z. Hollcraft, Resident Inspector
J. Braisted, Project Engineer
P. Elkmann, Senior Emergency Preparedness Inspector
W. Schaup, Resident Inspector

Approved By: G. Miller, Chief, Project Branch B
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000483/2011004; 06/24/2011 – 09/23/2011; Callaway Plant, Integrated Resident and Regional Report; Event Follow-up

The report covered a 3-month period of inspection by resident inspectors and an announced baseline inspections by region-based inspectors. One Green noncited violation and one Green finding 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 reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to correctly follow maintenance procedures which resulted in a failure of motor-operated valve EFHV0065 associated with the ultimate heat sink train A cooling tower. To perform its safety function the valve must be capable of being closed. On September 15, 2010, the mechanical maintenance department removed and rebuilt the actuator for the motor-operated valve. The valve actuator stop nuts were not set correctly and remained set outside the range of the electrical limits due to electrical maintenance workers failing to complete the procedure and work instructions initiated by the mechanical department. On June 22, 2011, an attempt to manually align essential service water return over the train A safety-related cooling tower failed when the motor-operated valve was manually positioned past the zero percent open position due to the improperly set stop nuts. This disengaged the valve operator worm from its worm gear, opened the valve, and rendered the valve being incapable of being closed. The immediate corrective action to replace the valve actuator was completed on June 23, 2011. The licensee initiated Callaway Action Request 201105074 to evaluate cause and extent-of-condition and specify corrective actions.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was 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 times, and did not affect

seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of human performance associated with the work controls component because the mechanical and electrical maintenance technicians failed to adequately maintain interfaces to communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance [H.3(b)](Section 4OA3).

- Green. The inspectors reviewed a self-revealing finding for the failure of AmerenUE engineering personnel to correctly establish the relay settings for the alternate emergency power supply diesel output breakers. On August 21, 2011, Callaway Plant experienced a loss of power to the alternate emergency power supply diesel bus PA05. This resulted in all four alternate emergency power supply diesels starting; however, the number three diesel output breaker immediately tripped open. The licensee determined that the breaker's protective relaying was improperly set. Further investigation by AmerenUE discovered that all four of the diesel output breakers had incorrect settings. The incorrect settings occurred due to the limited range of the relay chosen for the application and the engineering recommendations that prioritized protecting the diesel over limiting the margin to unintended breaker trips. Callaway engineering reviews had not identified the low margin to unintended trips. The licensee initiated corrective actions associated with Callaway Action Request 201106701 to change the differential current relay settings.

This finding is more than minor because it is associated with the design control attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding is of very low safety significance because it was a design deficiency that did not result in a loss of system safety function, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant per 10 CFR 50.65, for greater than 24 hours, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution because the licensee failed to implement a corrective action program with a low threshold for identifying issues commensurate with their safety significance [P.1(a)](Section 4OA3).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

The Callaway Plant began the inspection period at near 100 percent power. On September 9, 2011, the licensee performed a power reduction to approximately 91 percent power to enable a planned replacement of heater drain pump train A. The plant was returned to near 100 percent power on September 17, 2011. Callaway operated at near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On June 30, 2011, the inspectors performed a review of the adverse weather procedures for seasonal extremes (e.g., extreme high temperatures). The inspectors verified that weather-related equipment deficiencies identified during the previous year were corrected prior to the onset of seasonal extremes and evaluated the implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of, and during, the adverse weather conditions.

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 plant personnel were 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:

- The centrifugal charging pumps, the alternate emergency power supply diesels, and the class 1E switchgear air conditioning units

These activities constitute completion of one readiness for seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

Partial Walkdown

a. Inspection Scope

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

- July 5, 2011, emergency diesel generator train B
- July 14, 2011, essential service water train B during load shed emergency load sequencing testing
- August 4, 2011, all 120 volt vital AC inverters, busses, and loads during power supply replacement in cabinet SB 148B

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 three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 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:

- June 30, 2011, auxiliary building 1988' elevation room 1203, fire area A-1
- July 8, 2011, component cooling water heat exchanger and surge tank, fire area A-20
- July 11, 2011, ultimate heat sink train B cooling tower electrical equipment room, fire areas UNCT and UNST
- August 19, 2011, condensate storage tank area

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 four quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On August 7, 2011, the inspectors observed an unannounced fire brigade activation to respond to a simulated fire on reactor coolant pump C while at power. The observation evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of preplanned strategies; (9) adherence to the preplanned drill scenario; and (10) drill objectives.

These activities constitute completion of one annual fire-protection inspection sample as defined by 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 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.

- September 1, 2011, essential service water pump houses A and B
- September 2, 2011, main turbine lube oil tank room

These activities constitute completion of two flood protection measures inspection samples as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the ultimate heat sink and ultimate heat sink cooling towers. The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines;" the licensee properly utilized biofouling controls; the licensee's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and the heat exchanger was correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one heat sink inspection sample as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On August 17, 2011, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors

- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements. 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.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- June 12, 2011, Valve BMHV0001, inspected August 29, 2011, Callaway Action Request 201104904
- June 22, 2011, Valve EFHV0065, inspected August 29, 2011, Callaway Action Request 201105074

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
- Charging unavailability for performance
- 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:

- August 22, 2011, loss of local electrical cooperative power supply to the alternate emergency power supply diesel generators, Callaway Action Request 201106701
- August 30, 2011, emergent failure of emergency diesel generator train B supply fan, Callaway Action Request 201106905

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 two 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 (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- July 5, 2011, functionality determination of emergency offsite facility following loss of power, Callaway Action Request 201105387
- July 11, 2011, hydraulic leak on compressor SGK05B, Callaway Action Request 201105604
- July 13, 2011, operability of essential service water train A with supply air damper failed open, Callaway Action Request 201105700
- August 10, 2011, past operability review of loose bolting on emergency diesel generator train B piping, Callaway Action Request 201105371
- August 14, 2011, operability of essential service water train A with supply air damper failed open, Callaway Action Request 201106551

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and 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 personnel'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. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also 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 71111.15-04

b. Findings

No findings were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

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

- July 13, 2011, postmaintenance test of chemical and volume control system, valve BGLCV0124, Job 11003770
- August 11, 2011, postmaintenance test of the auxiliary/fuel building emergency exhaust fans and dampers, Jobs 10512327 and 10512208
- August 18, 2011, postmaintenance test of essential service water train A pump room ventilation dampers, Job 11004484
- September 1, 2011, postmaintenance test of emergency diesel generator train B supply fan motor, Job 11004741

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 postmaintenance 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 four postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

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.

- July 1, 2011, Procedure OTS-SF-00001, routine surveillance for control rod reposition, Job 11505947
- July 1, 2011, NK battery routine surveillance Procedure MSE-NK-QB02D, Job 11504046
- July 12, 2011, Reactor coolant system leak rate surveillance per Procedure OSP-BB-00009
- July 15, 2011, Routine surveillance involving the use of Technical Specification Surveillance Requirement 3.0.3 to delay testing of category A isolation valves, Callaway Action Request 201104577
- July 28, 2011, Inservice test of the turbine-driven auxiliary feedwater pump, Job 10504477

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

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

b. Findings

No findings were identified.

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

Cornerstone: Emergency Preparedness

a. Inspection Scope

The inspectors performed an in-office review of the Callaway Plant Radiological Emergency Response Plan, Revision 39, Procedure EIP-ZZ-00101, Addendum 1, "Emergency Action Level Classification Matrix," and Procedure EIP-ZZ-00101, Addendum 2, "Emergency Action Level Technical Bases Document," Revision 5. These revisions:

- Removed temporary administrative limits of 0.75 $\mu\text{Ci/g}$ and 45 $\mu\text{Ci/g}$ in emergency action level SU5.1, and returned to concentration thresholds of 1.0 $\mu\text{Ci/g}$ and 60 $\mu\text{Ci/g}$ as approved in a Safety Evaluation Report, dated October 3, 2008 (ADAMS Accession Numbers ML081580257 and ML0822003670). The administrative limits had been implemented in

March 2010 as compensatory measures for Callaway Action Request 201000527;

- Added the Sentry Notification System to Tables C-2 and S-2 as a communication system required to be lost prior to meeting a loss of internal or external communications system threshold in emergency action levels CU4.1 and SU4.2;
- Revised the layout drawing of the Emergency Operations Facility; and
- Changed the tone alert radio provided residents of the emergency planning zone to an All Hazards Weather Radio activated as part of the Emergency Alert System by the National Weather Service.

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

These activities constitute completion of two samples as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on August 3, 2011, which required emergency plan implementation by licensee operations crew 2. 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 simulator training sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A1 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 second quarter 2011 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 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams per 7000 critical hours performance indicator for the period from the third quarter 2010 through the second quarter 2011. 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, and NRC integrated inspection reports for the period of October 2010 through June 2011 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.

These activities constitute completion of one unplanned scrams per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams with complications performance indicator for the period from the third quarter 2010 through the second quarter 2011. 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, and NRC integrated inspection reports for the period of October 2010 through June 2011 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.

These activities constitute completion of one unplanned scrams with complications sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned power changes per 7000 critical hours performance indicator for the period from the third quarter 2010 through the second quarter 2011. 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, maintenance rule records, event reports, and NRC integrated inspection reports for the period of October 2010 through June 2011 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.

These activities constitute completion of one unplanned transients per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

40A2 Identification and Resolution of Problems (71152)

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

.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 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 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:

- August 8, 2011, spurious hot short vulnerability with valve EFHV0060, Callaway Action Request 201105861
- August 9, 2011, review of failure of motor-operated valve EFHV0065, Callaway Action Request 201105074
- August 25, 2011, nuclear oversight surveillance of security corrective action program, SP11-019

These activities constitute completion of three in-depth problem identification and resolution samples as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

40A3 Event Follow-up (71153)

.1 Alert Condition Declared for Release of Toxic Gasses

a. Inspection Scope

On September 18, 2011, Callaway Plant responded to a Freon leak at the train A control room air conditioning unit. The leak was pressurized by the unit's compressor oil system. Based on a review of the site's associated chemistry procedures which stated that Freon displaces air and is toxic, the shift manager determined that the event met the criteria to declare an emergency "Alert" condition. Emergency Action Level HA 3.1 for release of toxic gases which could jeopardize operation of systems needed for safe operation or safe shutdown was declared at 10:56 am. After the Freon leak was isolated and the room ventilated, the "Alert" was closed out at 5:49 pm.

The NRC resident inspectors responded to the plant to review plant status, communicate the event to supervision, evaluate performance of mitigating systems and ensure proper licensee actions, event classification, and notifications to the NRC and state/county governments. These actions were to ensure appropriate agency response.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report 05000483/2011-004-00, Post-Fire Safe Shutdown Latent Design Issue with Essential Service Water (ESW) Flow Balance

a. Inspection Scope

On July 20, 2011, a condition prohibited by technical specifications was identified associated with a possible fire induced actuation of valve EFHV0060. This valve has a required function to be closed for a post-fire plant safe shutdown. This design requirement is to ensure sufficient essential service water cooling flow to other safety related and safe shutdown loads. Immediate corrective actions were to ensure that a fire watch was established to minimize the likelihood the fire induced actuation could occur. The use of the fire watch as a compensatory measure is supported by recent evaluations associated with license amendment request ULNRC-05781 which determined that the change in risk associated with this issue is sufficiently low as to require no additional actions. The license amendment request is related to the Callaway Plant transitioning of its fire protection program to a National Fire Protection Association 805 endorsed licensing basis.

The inspectors reviewed the licensee's submittal and determined that the report adequately documented the summary of the event including the potential safety consequences and corrective actions required to address the performance deficiency. This licensee event report is closed.

b. Findings

No findings were identified.

.3 Valve Failure Renders Train A Essential Service System Inoperable

a. Inspection Scope

On June 22, 2011, the failure of motor operated valve EFHV0065 rendered the essential service water train A inoperable. The NRC resident inspectors responded to the plant to review plant status, communicate the event to supervision, evaluate performance of mitigating systems and ensure proper licensee actions.

b. Findings

.1 Introduction. The inspectors reviewed a Green self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the licensee's failure to correctly follow maintenance procedures resulted in a failure of the motor-operated valve associated with the ultimate heat sink train A cooling tower.

Description. On June 22, 2011, an operator workaround, performed to manually align return essential service water over the train A safety-related cooling tower, failed when the motor-operated valve was mispositioned to "open" due to improper maintenance. Previously, on September 15, 2010, the mechanical maintenance department removed and rebuilt the actuator for motor-operated valve EFHV0065 per Job 10513774. The

valve actuator stop nuts were set per Procedure MTM-ZZ-QA003, "Limitorque Operator Inspection and Maintenance Types HBC and WBO," Section 7.8 to the fully open and fully closed positions. The valve actuator stop nuts were not set correctly and remained set outside the range of the electrical limits due to a failure to complete the procedure and work instructions. The actuator worm drive is designed to travel along the sector gear over a 90 degree arc. Too much travel will result in the disengagement of the gearing.

Electrical maintenance technicians had properly set the electrical limits following the actuator rebuild per electrical maintenance Procedure MTE-ZZ-QA015, "Movats UDS Testing of Limitorque Motor Operated Butterfly Valves." However the procedure had been changed prior to this rebuild. The new revision of the rebuild guidance was not clear to the electricians and resulted in them closing the job without setting the actuator stop nuts. Prior to the change mechanical maintenance typically set the valve stop nuts. Subsequent manual operation of the valve, on June 22, 2011, compounded the problem when the technician failed to follow the procedural guidance to position the butterfly valve to zero percent open. The technician believed it was necessary to turn the valve until resistance was noticed and over-traveled the valve past the zero percent indicator. Other contributing factors for the mispositioning were that the technician did not have a copy of the procedural guidance for the valve manipulation and did not have a peer-check as required by Procedure ODP-ZZ-00001, "Operations Department Code of Conduct."

The inadvertent excessive actuator travel resulted in disengaging the valve gearing. System flow contributed to the disengagement and fully opened the valve. The damaged valve thus could not close to perform its safety function to redirect the return essential service water over the cooling tower fill material. About six hours later, the day shift technician noted the 15,000 gallons of water flowing past open valve EFHV0065 directly into the bottom of the cooling tower basin. Immediate actions by the licensee were to declare essential service water train A inoperable and enter the appropriate plant risk management and technical specification actions. Replacement of the valve actuator was completed on June 23, 2011. Callaway Action Request 201105074 was initiated to evaluate cause and extent-of-condition and specify corrective actions.

Analysis. The performance deficiency associated with this finding was the failure to follow procedural guidance that resulted in a significant loss of one train of essential service water. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was 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 times, and did not affect seismic, flooding, or severe weather initiating events. This finding has a cross-cutting aspect in the area of human performance associated with the work controls component because the mechanical and electrical maintenance departments failed to adequately maintain interfaces to communicate, coordinate, and

cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance [H.3(b)].

Enforcement. Technical Specification 5.4.1.a, "Procedures," required that written procedures be established, implemented and maintained covering the activities specified in Appendix A, "Typical Procedures for Pressurized Water Reactors," of Regulatory Guide 1.33, "Quality Assurance Program Requirements," February 1978. Appendix A, Item 9.a, required procedures for maintenance testing. Procedure MTE-ZZ-QA015, "MOVATS UDS Testing of Limitorque Motor Operated Butterfly Valves," was a maintenance restoration procedure. Contrary to the above, on September 15, 2010, the licensee failed to correctly implement Job 10513774 work instruction guidance per step 5.6.7 to "ADJUST the Close stop nut," which resulted in not performing the stop nut adjustment in Procedure MTE-ZZ-QA015. This resulted in a damaged valve that could not close to perform its safety function. Because this finding is of very low safety significance and was entered into the licensee's corrective action program as Callaway Action Request 201105074, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000483/2011004-01, "Failure to Correctly Implement Plant Maintenance Procedures."

.4 Incorrect Breaker Relay Settings Result in Partial Loss of Station Blackout Response Capability

a. Inspection Scope

On August 21, 2011, the number 3 alternate emergency power supply (AEPS) diesel output breaker tripped open due to incorrect breaker relay settings. The NRC resident inspectors responded to the plant to review plant status, communicate the event to supervision, evaluate performance of mitigating systems and ensure proper licensee actions.

b. Findings

- .1 Introduction. The inspectors reviewed a Green self-revealing finding involving the failure to correctly establish the relay settings for the alternate emergency power supply diesel output breakers.

Description. On August 21, 2011, with the plant at full power, Callaway Plant experienced a loss of Callaway Electric Cooperative power to the alternate emergency power supply (AEPS) diesel bus PA05. This local power company grid control communications circuitry failed resulting in the opening of feeder breaker PA50101. This resulted in all four AEPS diesels starting. However, on the starts, the number three diesel output breaker immediately tripped open. The licensee took immediate risk management actions and initiated corrective action reviews to determine the cause of the output breaker opening. The engineering reviews determined that the breaker response time trip settings were too low. The breaker's protective relaying sensed high differential current during the start of the four diesels. This high differential current

protection opened the number three diesel output breaker. Further investigation by AmerenUE discovered that all four of the diesel output breakers had incorrect settings.

The incorrect settings occurred due to the limited range of the relay chosen for the application and the contract engineering recommendations that prioritized protecting the diesel over limiting the margin to unintended breaker trips. The function of the AEPS diesels is to reliably respond to a station blackout situation. Callaway Procedure EDP-ZZ-04033, "Design Verification," required special scope design specifications and calculations to have design verification reviews to ensure the technical adequacy of the change. This procedure scope, step 2.2, was stated as being applicable to all products delivered by outside organizations. Step 3.3 required that the reviewing engineer evaluate design inputs, methodology, assumptions, and conclusions to ensure the adequacy of results. Callaway engineering reviews did not identify the low margin to unintended trips. The licensee initiated corrective actions to re-evaluate and change the differential current relay settings. These corrective actions were associated with Callaway Action Request 201106701.

Analysis. The performance deficiency associated with this finding was the failure of the licensee to perform an adequate modification review of the breaker relay settings as required by Procedure EDP-ZZ-04033, "Design Verification." This finding is more than minor because it is associated with the design control attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding is of very low safety significance because it was a design deficiency that did not result in a loss of system safety function, did not represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant per 10 CFR 50.65, for greater than 24 hours, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution because the licensee failed to implement a corrective action program with a low threshold for identifying issues commensurate with their safety significance [P.1(a)].

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirements. The finding is of very low safety significance and the issue was entered into the licensee's corrective action program as Callaway Action Request 201106701: FIN 05000483/2011004-02, "Failure to Evaluate Breaker Relay Settings Results in Partial Loss of Station Blackout Response Capability."

40A5 Other Activities

.1 (Closed) NRC Temporary Instruction 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01)"

a. Inspection Scope

The inspectors verified that the onsite documentation, system hardware, and licensee actions were consistent with the information provided in the licensee's response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." Specifically, the inspectors verified that the licensee has implemented or was in the process of implementing the commitments, modifications, and programmatically controlled actions described in the licensee's response to Generic Letter 2008-01. The inspection was conducted in accordance with Temporary Instruction 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01)," and considered the site-specific supplemental information provided by the Office of Nuclear Reactor Regulations (NRR) to the inspectors.

b. Inspection Documentation

The selected temporary instruction areas of inspection were licensing basis, design, testing, and corrective actions. The documentation of the inspection effort and any resulting observations are below.

Licensing Basis. The inspectors reviewed selected portions of licensing basis documents to verify that they were consistent with the NRR assessment report and that they were processed by the licensee. The licensing basis verification included the verification of selected portions of technical specifications, technical specifications bases, and final safety analysis report. The inspectors also verified that applicable documents that described the plant and plant operation, such as calculations, piping and instrumentation diagrams, procedures, and corrective action program documents, addressed the areas of concern and were changed if needed following plant changes. The inspectors also confirmed that the frequency of selected surveillance procedures were at least as frequent as required by technical specifications. Finally, the inspectors verified that the commitment to evaluate and implement the applicable changes that will be contained in the technical specification task force traveler was consistent with the commitment described in NRR's assessment report and that it addressed any comments provided by NRR.

Design. The inspectors reviewed selected design documents, performed system walkdowns, and interviewed plant personnel to verify that the design and operating characteristics were addressed by the licensee. Specifically:

- The inspectors verified that the licensee had identified the gas intrusion mechanisms that apply to the licensee's plant.

- The inspectors verified that the licensee's void acceptance criteria was consistent with NRR's void acceptance criteria. If NRR's acceptance criteria was not met, then the inspectors verified that the licensee has justified the deviations.
- The inspectors selectively reviewed applicable documents, including calculations, engineering evaluations, and vendor technical manuals, with respect to gas accumulation in the subject systems. Specifically, the inspectors verified that these documents addressed venting requirements, keep-full systems, aspects where pipes are normally void such as some spray piping inside containment, void control during system realignments, and the effect of debris on strainers in containment emergency sumps causing accumulation of gas under the upper elevation of strainers and the impact on net positive suction head requirements.
- The inspectors conducted a walkdown of selected regions of high pressure coolant injection system in sufficient detail to assess the licensee's walkdowns. The inspectors also verified that the information obtained during the licensee's walkdown was consistent with the items identified during the inspector's independent walkdown.
- In addition, the inspectors verified that the licensee had piping and instrumentation diagrams and isometric drawings that describe the containment spray system configurations and had confirmed the accuracy of the drawings resolution. The inspectors' review of the selected portions of isometric drawings considered the following:
 1. High point vents were identified.
 2. High points that do not have vents were recognizable.
 3. Other areas where gas can accumulate and potentially impact subject system operability, such as at orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and under closed valves, were described in the drawings or in referenced documentation.
 4. Horizontal pipe centerline elevation deviations and pipe slopes in nominally horizontal lines that exceed specified criteria were identified.
 5. All pipes and fittings were clearly shown.
 6. The drawings were up-to-date with respect to recent hardware changes and that any discrepancies between as-built configurations and the drawings were documented and entered into the corrective action program for resolution.

The inspectors also conducted a similar walkdown of selected portions of the residual heat removal and emergency core cooling systems in an earlier inspection period. This additional activity counted towards the completion of this

temporary instruction and was documented in Inspection Report 05000483/20100003.

- The inspectors verified that licensee's walkdowns have been completed. In addition, the inspectors selectively verified that information obtained during the licensee's walkdowns were addressed in procedures, the corrective action program, and training documents.

Testing. The inspectors reviewed selected surveillance, postmodification test, and postmaintenance test procedures and results to verify that the licensee has approved and was using procedures that were adequate to address the issue of gas accumulation and/or intrusion in the subject systems. This review included the verification of procedures used for conducting surveillances and determination of void volumes to ensure that the void criteria was satisfied and will be reasonably ensured to be satisfied until the next scheduled void surveillance. Also, the inspectors reviewed procedures used for filling and venting following conditions which may have introduced voids into the subject systems to verify that the procedures addressed testing for such voids and provided processes for their reduction or elimination.

Corrective Actions. The inspectors reviewed selected licensee's assessment reports and corrective action program documents to assess the effectiveness of the licensee's corrective action program when addressing the issues associated with Generic Letter 2008-01. In addition, the inspectors verified that selected corrective actions identified in the licensee's nine-month and supplemental reports were documented. The inspectors also verified that commitments were included in the corrective action program.

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

Based on this review, the inspectors concluded that there is reasonable assurance that the licensee will complete all outstanding items and incorporate this information into the design basis and operational practices. Therefore, this temporary instruction is considered closed.

c. Findings

No findings were identified.

40A6 Meetings

Exit Meeting Summary

On June 30, 2011, the inspectors discussed the results of in-office inspection of changes to the licensee's emergency plan and emergency action levels with Mr. S. Hogan, Assistant Manager, Protective Services, and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On September 16, 2011, the inspectors presented the Temporary Instruction 2515/177 inspection results to Mr. L. Kanuckel, Manager, Plant Engineering, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

On September 26, 2011, the resident inspectors presented the inspection results to Mr. A. Heflin, Senior Vice President and Chief Nuclear Officer and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

S. Abraham, Engineer
T. Antweiler, Construction Supervisor
T. Becker, Supervisor
J. Dowling, Equipment Reliability Manager
S. Hogan, Assistant Manager, Protective Services
G. Juricic, Emergency Response Coordinator
A. Lunn, System Engineer
V. Miller, Emergency Response Coordinator
B. Price, Operations Supervisor
A. Schnitz, Nuclear Licensing Engineer
N. Turner, Emergency Response Coordinator
D. Waller, Supervising Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2011004-01	NCV	Failure to Correctly Implement Plant Maintenance Procedures (Section 40A3)
05000483/2011004-02	FIN	Failure to Evaluate Breaker Relay Settings Results in Partial Loss of Station Blackout Response Capability (Section 40A3)

Closed

05000483-2011-004-00	LER	Post-Fire Safe Shutdown Latent Design Issue with Essential Service Water (ESW) Flow Balance
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LIST OF DOCUMENTS REVIEWED

Section 1RO1: Adverse Weather Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OTS-ZZ-0012	Severe Weather	22

CALLAWAY ACTION REQUESTS

201003582	201001515	201101818
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JOBS

11000356 10001457

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Caterpillar Project Sizing Report	August 3, 2011
	EMCP 3 AEPS engine controllers Temperature range and Power Requirements	August 3, 2011

Section 1RO4: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OTN-NN-00004	120V Vital AC Instrument Power-Class 1E (Channel 4)	1

JOBS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
09512201	Power Supply Replacement in Protection cabinet SB148B	August 4, 2011

Section 1RO5: Fire Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
HTP-ZZ-05006	Fire Inventory Radioactive Material or Entry into the RCA	8
APA-ZZ-0703	Fire Protection Operability Criteria and Surveillance Requirements	20
APA-ZZ-00741	Control of Combustible Materials	22

CALLAWAY ACTION REQUESTS

201106349

Section 1R06: Flood Protection Measures

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EDP-ZZ-01011	Buried Pipe Inspection Program	2

CALLAWAY ACTION REQUESTS

201107376 201107806

Section 1R07: Heat Sink Performance

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EDP-ZZ-01112	Heat Exchanger Predictive Performance Manual	17

CALLAWAY ACTION REQUESTS

201101328 201106180 201106474 201107081 201107832

Section 1R11: Licensed Operator Requalification Program

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
E-0	Reactor Trip or Safety Injection	14
E-2	Faulted Steam Generator Isolation	9

Section 1R12: Maintenance Effectiveness

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
APA-ZZ-00500, App 5	Maintenance Rule (MR)	11
EDP-ZZ-01128	Maintenance Rule Program	17
EDP-ZZ-01128, Appendix 4	Maintenance Rule System Functions	5
MTM-ZZ-QA003	Limatorque Operator Inspection and Maintenance Types HBC and WBO	11
MTE-ZZ-QA015	Movats UDS Testing of Limatorque Motor Operated Butterfly Valves	11
ODP-ZZ-00001	Operations Department Code of Conduct	66
OTN-EF-00001	Essential Service Water System	45

CALLAWAY ACTION REQUESTS

200902505 201105074 201104904

JOBS

105103774 11003379 11003314

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Masoneilan Spring-Diaphragm Actuator Instructions	March 1982

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EDP-ZZ-1129	Callaway Plant Risk Assessment	27

CALLAWAY ACTION REQUESTS

201106701 201106905 201107382

Section 1R15: Operability Evaluations

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
APA-ZZ-00500	Corrective Action Program	53
APA-ZZ-00500, App 1	Operability and Functionality Determinations	14
APA-ZZ-00500, App 14	Adverse Condition- Significance Level 3	11

CALLAWAY ACTION REQUESTS

201105365 201105371 201105387 201105604 201105700

201105861

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
201105365	Past Operability Determination	July 1, 2011

Section 1R19: Postmaintenance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
ITL-GD-000T1	Loop-Temp; ESW Pmp Rm Sply Fan (CGD01A) Temp	13

CALLAWAY ACTION REQUESTS

201105700

JOBS

11003770 11004484 11004741

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
MSE-NK-QB02D	Quarterly Surveillance on NK14 Large Station Batteries	13
ODP-ZZ-00029	RCS Leakage Action Level Guideline	0
OSP-BB-00009	RCS Inventory Balance	28
OTS-SF-00001	Control Rod Repositioning	9
OSP-RP-00003	Auxiliary Shutdown Panel Controls for the TDAFP Operability Test	15

CALLAWAY ACTION REQUESTS

201105478

JOBS

11505947 11504046 11507153 10504477

Section 1EP6: Drill Evaluation

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
E-0	Reactor Trip or Safety Injection	14
EIP-ZZ-00101	Classification of Emergencies	46

Section 4OA2: Identification and Resolution of Problems

CALLAWAY ACTION REQUESTS

201105608	201105074	201009798	201011161	201100062
201105073				

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
SEGR11-003	Independent Technical Review Potential Vulnerabilities of Essential Service Water System to Tornado Debris	June 20, 2011
OQC 11-026	Independent Quality Program Audit of Callaway Nuclear Oversight, AP11-007	August 2, 2011
SP11-018	Surveillance Report : Annual Assessment of the Security Program	August 9, 2011

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
APA-ZZ-00100	Written Instructions Use and Adherence	27

Section 4OA3: Event Follow-up

CALLAWAY ACTION REQUESTS

201105861	201104707	201106762	201107465
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MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
MSDS A2683	Material Safety Data Sheet (MSDS) for SUNISO Refrigeration Oil	
MSDS 717	MSDS FORANE 22	February 17, 2009
ZZ-548	Calculation of the AEPS Protective Relay Settings, Addendum 1	0
EN 47084	Event Notification Worksheet	July 21, 2011

Section 4OA5: Other Activities

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
ZZ-537	Gas Void Allowable Volumes for CCP and SI Pump Suction Headers	0
BN-24	Required Submergence for RWST Suction Pipe for Vortex Prevention	0
TDI-6002-07 / TDI-6003-07	Vortex, Air Ingestion & Void Fraction	1
EJ-39	Maximum Vent Times for Points Vented in Procedure OSP-SA-0003	0
EJ-39, Add. 2	Maximum Vent Times for Points Vented in OSP-SA-00003 per C-4190-00-01	0
EJ-50	Temperature at which Standby RHR Train can be put in Service	0
FAI/08-78	Methodology for Evaluating Waterhammer in the Containment Spray Header and Hot Leg Switchover Piping	0

R-4152-00-1 Maximum Vent Volumes for Points Vented in
 Procedure OSP-SA-00003 0

CALLAWAY ACTION REQUESTS

201007148	201007149	201007152	200700224	200800298	201004078
201006714	200608466	200702132	201010566	201100696	
201100697	201100698	201004078	200809255	200810810	
201004826	201004905	201006956	201007614	201011150	

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-22BG03	Piping and Instrumentation Diagram Chemical Volume and Control System	54
M-23BG02	Piping Isometric CVCS-Max. Charging Flow A & B Train-Auxiliary Bldg.	12
M-22EM01	Piping and Instrument Diagram High Pressure Coolant Injection System	35
M-22EN01	Piping and Instrumentation Diagram Containment Spray System	16
M-23EJ01	Piping Isometric Residual Heat Removal System Auxiliary Building	19
M-23EM01	Piping Isometric High Pressure Coolant Injection System – Aux Bldg	11

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
OTG-ZZ-00006	Plant Cooldown Hot Standby to Cold Shutdown	62
OSP-SA-00003	Emergency Core Cooling System Flow Path Verification and Venting	40

OTN-BG-00001	Chemical and Volume Control System	47
OTN-EM-00001	Safety Injection System	32
OTN-EN-00001	Containment Spray System	20
OTN-EP-00001, Add. 3	Initial Fill and Vent of SI Accumulators	5
ODP-ZZ-00310, Att. 5	Fill and Vent Guide	45
APA-ZZ-00600, Att. 1	Essential Design Inputs	41
STARS-ENG- 5001-8.1	Engineering Disposition	0
STARS-ENG- 5001-8.2	Engineering Screen: Hazards Review	May 10, 2011
APA-ZZ-00396	Gas Intrusion Program	0
ODP-ZZ-00310	WPA and Caution Tagging	48
CTP-ZZ-02710	Gas Venting of Plant Systems	2
OSP-EJ-PV04A	Train A RHR and RCS Check Valve Inservice Test – IPTE	5

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
TS 3.5	Emergency Core Cooling Systems (ECCS)	133
TSB 3.5	Emergency Core Cooling Systems (ECCS)	8
FSAR 6.3	Emergency Core Cooling System	OL-17

T61.0810.8	Operator Proficiency Topics, Cycle 10-5	October 15, 2010
	Attendance Records for T61.0810.8	November 1, 2010
T62.F011 6	Gas Accumulation for Engineering	March 8, 2011
	Attendees Report for T62.F011	July 19, 2011
T65.0255.6	How Maintenance Can Manage Gas Accumulation	December 7, 2010
200803669	Request for Resolution	
AREVA-08-02740		August 20, 2011
MS-06-84	Valve Sizing Technical Bulletin – Swagelok	4
	Pipe Slope Report	September 9, 2011
	(ECCS) System Graphs	
	ECCS High Points Evaluation	
	Froude Number Calculator	
	Venting Trends (OSP-SA-0003 History)	August 9, 2011
Job 10506394	OSP-SA-00003, Rev. 36, Att. 1	
PM 0905048	Train B ECCS PMP Venting – Mode 4	May 26, 2004
MP 08-0016	Install Bypass Lines Around ENV0002 and ENV0008 to Allow Proper Venting and Draining	0

MP 07-0016	Install additional vents on SI pump discharge piping	0
SA10-PE-F02	Formal Self Assessment Report – System Gas Accumulation Management Program	November 1-4, 2010
	RHR Pump A Full Flow Test (RF-17)	April 23, 2010
	ST0A – RHR Pump A PEJ01 –Amp Motor Current – I0004	April 27, 2011
	ST0A – RHR Pump A PEJ01 –FLO Pump Flow – Local+Cont. Room	April 27, 2011