UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

August 2, 2007

Charles D. Naslund, Senior Vice
President and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2007003

Dear Mr. Naslund:

On June 23, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. The enclosed report documents the inspection findings, which were discussed on June 22, 2007, with Mr. C. Naslund, Senior Vice President and Chief Nuclear Officer, and other members of your staff.

This 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. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

This report documents three findings that were evaluated under the risk Significance Determination Process as having very low safety significance (Green). The NRC has determined that violations are associated with these issues. Additionally, licensee identified violations which were determined to be of very low safety significance are listed in this report. These violations are being treated as noncited violations, consistent with Section VI.A of the Enforcement Policy. The noncited violations are described in the subject inspection report. If you contest these violations or the significance of these 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, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Callaway Plant facility.

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 made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Vincent G. Gaddy, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

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w/attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-483
License:	NPF-30
Report Number:	05000483/2007003
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, Missouri
Dates:	March 25 through June 23, 2007
Inspectors:	M. S. Peck, Senior Resident Inspector D. E. Dumbacher, Resident Inspector G. L. Guerra, CHP, Health Physicist, Plant Support Branch D. P. Loveless, Senior Reactor Analyst S. T. Makor, Reactor Inspector, Engineering Branch 1 J. M. Mateychick, Senior Reactor Inspector, Engineering Branch 2 J. P. Reynoso, Reactor Inspector, Engineering Branch 1
Accompanying Personnel:	L. E. Ellershaw, PE, Consultant
Approved By:	V. G. Gaddy, Chief, Project Branch B

CONTENTS

SUMMARY OF FINDINGS

IR 05000483/2007003; 03/25/2007 - 06/23/2007; Callaway Plant: Equipment Alignment, Refueling and Outage Activities, and Identification and Resolution of Problems.

This report covered a 3-month inspection by resident inspectors. Three Green noncited violations 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." Findings for which the Significance Determination Process does not apply may be Green or assigned a severity level after NRC management review. The NRC's program of overseeing the safe operation of commercial nuclear power reactors is described in NUREG 1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," after AmerenUE failed to implement effective corrective actions to correct discrepancies in the ultimate heat sink design basis. The system design basis required the ultimate heat sink automated temperature controller to align the cooling tower only when outside temperatures were above 80 degrees Fahrenheit. AmerenUE allowed manual operation of the system when temperatures were above 47 degrees Fahrenheit. The engineering staff and later the quality assurance staff independently identified that the design basis operating requirements had not been adequately evaluated. The inspectors identified that the corrective actions assigned had been closed out as complete without problem resolution and that the ultimate heat sink cooling towers were operated on April 3, 2007, when outside conditions were below 29 degrees Fahrenheit. The uncontrolled workaround resulted in AmerenUE subjecting the cooling tower fill material and fan to freezing conditions.

  This finding is greater than minor because it is associated with the mitigating systems cornerstone equipment performance attribute and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, this finding was determined to have very low safety significance because it affected the mitigating systems cornerstone, which was both a performance and design deficiency that did not represent a loss of a safety function, and did not affect seismic, flooding or severe weather initiating events. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not thoroughly evaluate problems such that the resolution would address causes and extent of conditions, as necessary (P.1(c)). This issue was entered into the licensee's corrective action program as Callaway Action Request 200703584 (Section 1R04).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," after AmerenUE's past corrective actions were inadequate to identify and correct essential service water piping degradation due to corrosion. AmerenUE identified that nondestructive examinations were required to determine the extent of condition of microbiological influenced corrosion on the 30-inch and 8-inch essential service water piping. On May 3, 2007, operability determinations used to support Refueling Outage 15 restart stated that 100 percent of the low flow area accessible piping would be tested using nondestructive examination. On May 26, 2007, microbiological influenced corrosion caused a new through-wall leak in the control building low flow, accessible piping. The licensee's extent of condition review was not adequate to identify the corroded pipe prior to the through-wall leak.

  This finding, associated with failure to implement corrective action, is greater than minor because, if left uncorrected, this finding would become a more significant safety concern. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, this finding was determined to have very low safety significance because it affected the mitigating systems cornerstone, was both a performance and design deficiency that did not represent a loss of a safety function, and did not affect seismic, flooding or severe weather initiating events. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not thoroughly evaluate problems such that the resolution would address causes and extent of conditions, as necessary (P.1(c)). This issue was entered into the licensee's corrective action program as Callaway Action Request 200705489 (Section 4OA2).

Cornerstone Barrier Integrity

- Green. The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," after refueling personnel did not maintain procedurally required foreign material exclusion barriers. AmerenUE's foreign material exclusion procedure specified attaching foreign material exclusion curtains to the plant north end of the reactor head missile shield to ensure no foreign material was introduced into the reactor vessel. On April 19, 2007, the inspectors observed the reactor refueling task and noted that there were no curtains acting as the north refueling cavity boundary.

  This finding is greater than minor because, if left uncorrected, introduction of foreign material into the reactor cavity would become a more significant safety concern. The barrier integrity cornerstone human performance attribute is used to ensure foreign material and loose parts do not challenge fuel cladding. The inspectors determined this finding to be of very low safety significance using the significance determination process for at-power reactor situations. The inspectors used the at-power significance determination process because of the concern with foreign material impact on an operating reactor core. This finding is of very low safety significance per Inspection Manual Chapter 0609 because the condition was a fuel barrier issue. This finding had a crosscutting aspect in the area of human performance associated with the resources component because plant operators failed to follow procedures established to prevent

the introduction of foreign material into the reactor vessel (H.4(b)). This issue was entered into the licensee's corrective action program as Callaway Action Request 200704169 (Section 1R20).

B. Licensee-Identified Violations

Three violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and their corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

AmerenUE operated the Callaway Plant at full power at the beginning of the inspection period. On April 2, 2007, AmerenUE shut down the plant and began Refueling Outage 15. During the outage, the licensee modified the containment recirculation sumps, replaced the main steam isolation valves, and completed significant repairs to essential service water system piping. AmerenUE restarted the plant on May 10, 2007 and returned the unit to full power on May 14, 2007. AmerenUE operated the plant at full power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors: (1) walked down portions of risk important systems and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned; and (2) compared deficiencies identified during the walkdown to AmerenUE's Final Safety Analysis Report (FSAR) and corrective action program to ensure problems were being identified and corrected.

- April 27, 2007, Train B Essential Service Water System
- June 18, 2007, Train B Control Room Ventilation System

Documents reviewed by the inspectors included:

- Piping and Instrument Drawing M-U2EF01, Essential Service Water System, Revision 55
- Piping and Instrument Drawing M-22-GK01, Control Building HVAC, Revision 15
- Piping and Instrument Drawing M-22-GK02, Control Building HVAC, Revision 17
- Piping and Instrument Drawing M-22-GK03, Control Building HVAC, Revision 19
- Piping and Instrument Drawing M-22-GK04, Control Building HVAC, Revision 17
- Callaway Action Request (CAR) 200704465, Essential Service Water System Material Condition for Restart from Refueling Outage 15

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown (71111.04S)

a. Inspection Scope

The inspectors: (1) reviewed plant procedures, drawings, the FSAR, Technical Specifications, and vendor manuals to determine the correct alignment of the ultimate heat sink system; (2) reviewed outstanding design issues, piping repair and replacement activities, operator workarounds, and FSAR documents to determine if open issues affected the functionality of the system; and (3) verified that the licensee was identifying and resolving equipment alignment problems.

Documents reviewed by the inspectors included:

- CAR 200703556, Allow Ultimate Heat Sink Cooling Tower Operations at Wet-bulb Temperature less than 47 degrees Fahrenheit
- CAR 200703279, Inspect Ultimate Heat Sink Cooling Tower Fill Material to Ensure No Damage
- Piping and Instrument Drawing M-U2EF01, Essential Service Water System, Revision 55

The inspectors completed one sample.

b. Findings

Ineffective Corrective Actions to Evaluate the Design Basis for an Ultimate Heat Sink Workaround.

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” after AmerenUE failed to implement effective corrective actions to correct discrepancies in the ultimate heat sink design basis. As a result, the licensee operated the ultimate heat sink cooling towers when outside conditions were below the minimum required temperatures to prevent freezing of system components.

Description. The inspectors identified that the licensee had not corrected discrepancies in the ultimate heat sink design basis. In 2003 and 2005 engineering personnel initiated corrective action documents CAR 200306252, “Manual Override of Ultimate Heat Sink Cooling Tower Inlet Bypass Valves,” and CAR 200505716, “Override of Ultimate Heat Sink Cooling Tower Safety Limit Setpoints,” to establish the cooling tower system design bases allowing manual operation. In 2006, the licensee’s independent assessment organization recognized that the corrective actions were less than adequate and initiated CAR 200604872, “Configuration Control Issue - UHS Cooling Water Bypass Valves,” to validate the design change. In 2007, the inspectors identified that the licensee had

closed out CAR 200604872 without completing assigned corrective actions.

On April 3, 2007, the inspectors identified that plant operators were operating the ultimate heat sink in manual mode outside the established design basis. The cooling tower vendor limited operation to temperatures above 80 degrees Fahrenheit to ensure freeze protection of the system components. Outside air temperature decreased significantly overnight to a wet-bulb temperature of less than 29 degrees Fahrenheit. The inspectors identified that the operators were unaware that a configuration contrary to the operating procedure existed. This was a violation of the licensee's procedure and an uncontrolled workaround that resulted in subjecting the ultimate heat sink cooling tower fill material and fan to freezing conditions. On April 9, 2007, after temperatures had increased above freezing, the licensee performed an inspection and found no apparent damage to the cooling tower components.

Analysis. Failure of the licensee to implement adequate corrective actions to translate the ultimate heat sink design bases into operating specifications was a performance deficiency. This finding is greater than minor because, if left uncorrected, this finding would become a more significant safety concern. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, this finding was determined to have very low safety significance because it affected the mitigating systems cornerstone, involved performance and design deficiencies that did not represent a loss of a safety function, and did not affect seismic, flooding or severe weather initiating events. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not thoroughly evaluate problems such that the resolution would address causes and extent of conditions, as necessary (P.1(c)).

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures be taken to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to take action to promptly identify and correct a condition adverse to quality. Specifically, in 2003, 2005, and 2006, several examples existed that demonstrated that AmerenUE did not take measures to evaluate and correct adverse operating design changes made to the ultimate heat sink system components. Because this finding is of very low safety significance and was entered into the corrective action program (CAR 200703584), this violation is being treated as a noncited violation in accordance with Section VI.A.1 of the Enforcement Policy:
NCV 05000483/2007003-01, Ineffective Corrective Actions to Evaluate the Design Basis for an Ultimate Heat Sink Workaround.

1R05 Fire Protection (71111.05)

Quarterly Inspection (71111.05Q)

a. Inspection Scope

The inspectors walked down the eight listed plant areas to assess the material condition of active and passive fire protection features and their operational lineup and readiness. The inspectors: (1) verified that transient combustibles and hot work activities were

controlled in accordance with plant procedures; (2) observed the condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional and that access to manual actuators was unobstructed; (4) verified that fire extinguishers and hose stations were provided at their designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers, steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified that adequate compensatory measures were established for degraded or inoperable fire protection features and that the compensatory measures were commensurate with the significance of the deficiency; and (7) reviewed the FSAR to determine if AmerenUE identified and corrected fire protection problems.

- April 9, 2007, Fire Area RB, Reactor Building
- May 17, 2007, Fire Areas U104 and U105, Essential Service Water Pump Rooms
- May 17, 2007, Refueling Water, Condensate, and Diesel Fuel Oil Storage Tanks
- May 29, 2007, Fire Area A-5, Auxiliary Building South Stairwell and Elevator
- May 29, 2007, Fire Area A-6, Auxiliary Building North Stairwell and Elevator
- May 30, 2007, Fire Area C-9, Engineered Safety Features Switchgear Room, North 3301
- May 30, 2007, Fire Area C-10, Engineered Safety Features Switchgear Room, South 3302
- June 18, 2007, Fire Area A-18, North Electrical Penetration Room

Documents reviewed by the inspectors included:

- Procedure APA-ZZ-0741, Control of Combustible Materials, Revision 18
- Fire Protection Impairment Permit 13236, Activated May 30, 2007
- Modification MP 07-0050, Revision 0, Modification to Fire Door DSK 15031

The inspectors completed eight samples.

Annual Inspection

On April 5, 2007, the inspectors observed the plant fire brigade's response to a fire in the control building south battery and switchboard rooms. The inspectors evaluated the readiness of licensee personnel to prevent and fight fires, including the following aspects: (1) the number of personnel assigned to the fire brigade, (2) use of protective clothing, (3) use of breathing apparatuses, (4) use of fire procedures and declarations of emergency action levels, (5) command of the fire brigade, (6) implementation of pre-fire strategies and briefs, (7) access routes to the fire and the timeliness of the fire brigade response, (8) establishment of communications, (9) effectiveness of radio

communications, (10) placement and use of fire hoses, (11) entry into the fire area, (12) use of fire fighting equipment, (13) searches for fire victims and fire propagation, (14) smoke removal, and (15) use of pre-fire plans, and (16) restoration from the fire.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed AmerenUE programs, verified performance tests against industry standards, and reviewed critical operating parameters and maintenance records for the Train B component cooling water heat exchanger. The inspectors verified that: (1) performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; (2) AmerenUE utilized the periodic maintenance method outlined in Electric Power Research Institute NP-7552, "Heat Exchanger Performance Monitoring Guidelines"; (3) AmerenUE properly utilized biofouling controls; (4) AmerenUE's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and (5) the heat exchanger system was correctly categorized under the maintenance rule.

- April 2, 2007, Train B Component Cooling Water Heat Exchanger Performance Test

Documents reviewed by the inspectors included:

- Calculation Report for Train B Component Cooling Water Heat Exchanger Proto-Hx 4.10 EEG01B Provided by Proto Power Corporation (SN#PHX-0000) on April 2, 2007

- Surveillance 04503553, Procedure ETP-EG-00002, Component Cooling Water Heat Exchanger Performance Test, Revision 6

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (71111.08)

Inspection Procedure 71111.08 requires a minimum sample size of four (as identified in Sections 02.01, 02.02, 02.03, and 02.04).

.1 Performance of Nondestructive Examination Activities Other Than Steam Generator Tube Inspections, Pressurized Water Reactor Vessel Upper Head Penetration Inspections, Boric Acid Corrosion Control

a. Inspection Scope

The inspection procedure required the review of nondestructive examination activities consisting of two or three different types (i.e., volumetric, surface, or visual). The inspectors witnessed the performance of: 2 ultrasonic examinations (volumetric) on main steam system welds; 11 ultrasonic examinations (volumetric) on reactor vessel head control rod drive mechanism (CRDM) nozzles; 1 liquid penetrant examination (surface) on a residual heat removal system weld, and 2 visual examinations (visual) on component cooling water system component supports. The licensee is currently in their third 10-year inservice inspection interval, which began on December 19, 2004, and will routinely end on December 18, 2014.

The table below identifies the above examinations, which were conducted using three methods and three different examination types.

Component	Identity	Examination Type	Examination Method
Main Steam System pipe-to-pipe weld	2-AB-01-F074	Volumetric	Ultrasonic (Report UT-07-018)
Main Steam System pipe-to-pipe weld	2-AB-01-F007	Volumetric	Ultrasonic (Report UT-07-019)
Reactor Vessel Head Penetration Nozzles	CRDM Nozzle numbers 8, 17, 21, 31, 36, 47, 54, 64, 71, 75, and 77	Volumetric	Ultrasonic (Reports identified by CRDM Nozzle numbers)
Residual Heat Removal System integral attachment (to pipe) weld	2-EJ-03-A003	Surface	Liquid Penetrant (Report PT-07-003)
Component Cooling Water System Component Support	EG-09-C001-231	Visual	VT-3 (Report 05042-07-020)
Component Cooling Water System Component Support	EG-06-R008-123	Visual	VT-3 (Report 05042-07-021)

Additionally, the inspectors reviewed the nondestructive examination reports for the following six surface examinations:

- One magnetic particle examination report (MT-07-001) performed on main steam line valve bonnet bolting identified as Component 2-AB-01-HV-14-6-R

- Five liquid penetrant examination reports (900708-07, -19, -20, -21, and -23) performed on the sacrificial stainless steel and Alloy 52 structural weld overlays on Pressurizer Nozzle TBB003

For each of the nondestructive examination activities observed, the inspectors verified that the examinations were performed in accordance with the specific site procedures and the applicable American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) requirements. The inspectors also verified that the ultrasonic examination procedure (AUE-UT-98-1) used for the two main steam line system pipe welds had been appropriately qualified in accordance with Appendix VIII to Section XI of the ASME Code (Performance Demonstration Initiative), and had been demonstrated to the satisfaction of the Authorized Nuclear Inservice Inspector.

During review of each examination, the inspectors verified that appropriate nondestructive examination procedures were used, that examinations and conditions were as specified in the procedure, and that test instrumentation or equipment was properly calibrated and within the allowable calibration period. The inspectors also verified that the personnel who performed the above ultrasonic, magnetic particle, visual, and liquid penetrant examinations were properly certified.

The inspection procedure required review of one or two examinations with recordable indications that were accepted for continued service to ensure that the disposition was made in accordance with the ASME Code. The inspectors reviewed CAR 200403580, which documented the identification of flaws in cold leg inlet nozzle safe end-to-elbow Weld 2-BB-01-F302. The flaws were identified, evaluated, and documented on April 30, 2004, during the volumetric (ultrasonic and eddy current) examinations conducted during Refueling Outage 13. The inspectors reviewed the results of this examination. The licensee contracted to have an analytical evaluation performed by both Westinghouse and Structural Integrity Associates in accordance with ASME Code Section XI, IWB-3640, which provides the specific rules for the performance of such evaluations. The results of the evaluations (performed in 2004) supported continued unit operation for three years leaving the flaws as-is (i.e., no repairs required at that time).

The inspectors also reviewed the original (construction) radiographic film. The film was of such poor quality that it was not possible to determine the existence of an indication. The licensee, in a further attempt to determine if the indications had existed since construction, produced a digitized film from the original construction film. While inconclusive, the digitized film appeared to exhibit a very faint linear-type indication.

Subsequent to the exit meeting conducted on April 12, 2007, the licensee performed a volumetric (ultrasonic) examination of the area of the cold leg containing the indication. The examination results were documented in the licensee's report, "Refueling

Outage 15 Reactor Vessel Examination Summary," dated April 15, 2007, which was provided to the inspectors for review. A review of the report, the ultrasonic examination scan sheets (detection, B, and C) and Indication Assessment Sheet W247-IND-1, provided the data which showed that Indication 1 was still acceptable in accordance with Subarticle IWB 3514-2 in Section XI of the ASME Code. Indication 2, which was previously and currently unacceptable in accordance with IWB-3514-2, had not changed appreciably from the previous examination performed during April 2004. Therefore, the results of the evaluations performed previously in 2004 under the rules of Subarticle IWB-3640 of Section XI of the ASME Code are still valid. Those results supported continued unit operation for three years leaving the flaws as-is (i.e., no repairs required at this time).

The inspection procedure further required verification of one to three welds on Class 1 or 2 pressure boundary piping to ensure that the welding process and welding examinations were performed in accordance with the ASME Code. The inspectors observed portions of the preemptive weld overlay on the ASME Code Class 1 pressurizer surge line nozzle dissimilar weld identified as follows:

Component	Weld Identity	Welding Process
Pressurizer Elbow to Nozzle	Nozzle TBB03 dissimilar weld	Gas Tungsten Arc Welding (Machine)

Additionally, the inspectors observed manual gas tungsten arc welding performed on ASME Code Class 3 small bore essential service water piping. This welding was a stainless steel weld joining carbon steel to stainless steel using ER 309L welding filler material. The applicable weld was FW-10 identified in Work Request 06114493-500.

The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX requirements. The inspectors also verified, through observation and record review, that essential variables for the gas tungsten arc welding process had been identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specification.

The inspectors also verified by observation that weld filler materials were properly stored and controlled and that proper administrative controls were being implemented with respect to issuance and return of weld filler materials.

The inspectors completed one sample under this section.

b. Findings

No findings of significance were identified.

.2 Reactor Vessel Upper Head Penetration Inspection Activities

The inspection procedure requires this section to be performed after completion of Temporary Instruction TI 2515/150, "Reactor Pressure Vessel and Vessel Head Penetration Nozzles." The TI had not been completed for the Callaway Plant at the time of this inspection, thus this section was not performed. Applicable sections of the TI, however, were performed with the inspection results reported in Section 4OA5, "Other Activities."

.3 Boric Acid Corrosion Control Inspection Activities (Pressurized Water Reactors)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be deleteriously affected by boric acid corrosion.

The inspection procedure required review of a sample of boric acid corrosion control walkdown visual examination activities through either direct observation or record review. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedure EDP-ZZ-01004, "Boric Acid Corrosion Control Program," Revision 4. Visual records of the components and equipment were also reviewed by the inspectors.

Additionally, the inspectors independently performed examinations of piping containing boric acid during a walkdown of the containment building and the auxiliary building.

The inspection procedure required verification that visual inspections emphasize locations where boric acid leaks can cause degradation of safety significant components. The inspectors verified through direct observations, including touring the reactor building with the resident inspector and by program/record review that the licensee's boric acid corrosion control inspection efforts are directed towards locations where boric acid leaks can cause degradation of safety-related components. On those components where boric acid was identified, the engineering evaluations gave assurance that the ASME Code wall thickness limits were properly maintained. The evaluations also confirmed that the corrective actions performed for evidence of boric acid leaks were consistent with requirements of the ASME Code.

The inspection procedure required both a review of one to three engineering evaluations performed for boric acid leaks found on reactor coolant system piping and components, and one to three corrective actions performed for identified boric acid leaks. The inspectors reviewed engineering evaluations associated with CARs 200510316, 200600295, 200601263, 200602580, 200603745, 200606821, and 200610436, which addressed boric acid leaks identified on reactor coolant system, containment spray, residual heat removal, safety injection accumulator man-way and chemical volume and control system pumps and valves. The evaluations appropriately addressed the causes and corrective actions, and were generally consistent with industry standards.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

The inspectors verified that the steam generator tube eddy current examination scope met Technical Specification 5.5.9 “Steam Generator (SG) Program,” requirements, industry guidelines, and commitments made to the NRC. Since this was the first post replacement in-service examination of the steam generators a confirmatory review of licensee operational assessment was not possible. The inspectors reviewed the licensee End-of-Cycle 15 Steam Generator Degradation Assessment, dated April 9, 2007, to confirm that known areas of potential degradation based on site-specific and industry experience were included in the scope of the inspection and steam generator program.

The licensee had scheduled a 100 percent tube inspection of all four replacement steam generators and planned for a foreign object search and retrieval into all steam generators to determine the cleanliness and general condition of the steam generators’ internals. The inspectors selected and reviewed the acquisition technique sheets and their qualifying EPRI examination technique specification sheets to verify that the essential variables regarding flaw sizing accuracy had been identified and qualified through demonstration. The inspectors observed the collection and analysis of eddy current data by contractor personnel and verified that: (1) the eddy current probes being utilized were appropriate for identifying the expected types of indications, (2) probe position location verification was being performed, (3) calibration requirements were being adhered to, and (4) probe travel speed was in accordance with procedural requirements.

The inspectors completed one sample under this section.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection scope.

The inspection procedure required review of a sample of problems associated with inservice inspections documented by the licensee in the corrective action program for appropriateness of the corrective actions.

The inspectors reviewed nine CARs, which dealt with inservice inspection activities, and found that the corrective actions were appropriate. From this review the inspectors concluded that the licensee had an appropriate threshold for entering issues into the

corrective action program and had procedures that direct a root cause evaluation when necessary. The licensee also had an effective program for applying industry operating experience.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q)

a. Inspection Scope

The inspectors reviewed the two listed maintenance conditions to: (1) verify the appropriate handling of structures, systems, and component performance or condition problems; (2) verify the appropriate handling of degraded structures, systems, or component functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of structures, systems, or component issues reviewed under the requirements of the maintenance rule, 10 CFR Part 50, Appendix B, and the Technical Specifications.

- June 15, 2007, Failures Associated with the Atmospheric Steam Dump System
- June 18, 2007, Failures Associated with the Digital Control Rod Position Indication System

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the six below listed assessment activities to verify: (1) performance of risk assessments when required by 10 CFR 50.65 (a)(4) and licensee procedures prior to changes in plant configuration for maintenance activities and plant operations; (2) the accuracy, adequacy, and completeness of the information considered in the risk assessment; (3) that the licensee recognizes, and/or enters as applicable, the appropriate licensee-established risk category according to the risk assessment results and licensee procedures; and (4) the licensee identified and corrected problems related to maintenance risk assessments.

- April 4, 2007, Planned Reduced Reactor Vessel Inventory
- April 9, 2007, Planned Maintenance of Safeguards Transformer XNB02

- April 10, 2007, High Spent Fuel Pool Temperature Contingency Plan
- April 15, 2007, Planned Maintenance of Safeguards Transformer XNB01
- April 15, 2007, Planned Maintenance on Train A Essential Service Water Support
- April 26, 2007, Mid-loop Operations

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors: (1) reviewed plant status documents such as operator shift logs, emergent work documentation, deferred modifications, and standing orders to determine if an operability determination was warranted for degraded components; (2) referred to the FSAR and design basis documents to review the technical adequacy of licensee operability determinations; (3) evaluated compensatory measures associated with operability determinations; (4) determined degraded component impact on any Technical Specifications; (5) used the Significance Determination Process to evaluate the risk significance of degraded or inoperable equipment; and (6) verified that AmerenUE has identified and implemented appropriate corrective actions associated with degraded components.

- April 4, 2007, Callaway Action Request 200703257, Through-wall Leak in the Train A Residual Heat Removal Room Cooler
- April 14, 2007, Callaway Action Request 200703899, Through-wall Leak in Train A Underground Essential Service Water Piping
- May 4, 2007, Callaway Action Request 200704465 and Cycle 16 Operation Document NE-02, Callaway Acceptability of Essential Service Water System for Cycle 16 Operation
- May 21, 2007, Callaway Action Request 200705410, Train A Emergency Diesel Generator Annunciator Failures due to Local Panel KJ121 Blown Fuse
- May 26, 2007, Callaway Action Request 200705489, Through-wall Leak in Large Bore Essential Service Water Piping

The inspectors completed five samples.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modification (71111.17)

Annual Review

a. Inspection Scope

The inspectors reviewed Modification MP-00-1009B which replaced the actuators and modified the seating surface of the four main steam isolation valves. The inspectors verified that necessary Technical Specification changes have been identified and NRC approvals, if required, were obtained prior to modification implementation. The inspectors verified acceptability of licensee's conclusions for the modification when evaluated in accordance with 10 CFR 50.59.

Documents reviewed by the inspectors included:

- NRC NUREG 800, Standard Review Plan, Revision 2
- Surveillance 06523157, Main Steam Isolation Valve Inservice/Modification Test in Mode 4, May 5, 2007

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the four listed postmaintenance test activities of risk significant systems or components. For each item, the inspectors: (1) reviewed the applicable licensing-basis and/or design-basis documents to determine the safety functions; (2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly re-aligned, and deficiencies during testing were documented. The inspectors also reviewed the FSAR to determine if AmerenUE identified and corrected problems related to postmaintenance testing.

- April 18, 2007, PMT 05111232.920, Train A Containment Recirculation Sump Motor-operated Valve EMV8811A Following Rebuilding of the Motor

- April 20, 2007, PMT 05108708.900, Train A Load Shedding Emergency Load Sequencing Power Supply Replacement

- May 5, 2007, PMT 711061.914, Train B Motor-driven Auxiliary Feedwater Pump Following Preventive Maintenance

- June 4, 2007, PMT 709123.910, Train A Class 1E Electrical Equipment Air Conditioning Unit Following Preventative Maintenance

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the following risk significant refueling items or outage activities to verify defense-in-depth commensurate with the outage risk control plan, compliance with the Technical Specifications, and adherence to commitments in response to Generic Letter 88-17, “Loss of Decay Heat Removal”: (1) the risk control plan; (2) tagging/clearance activities; (3) reactor coolant system instrumentation; (4) electrical power; (5) decay heat removal; (6) spent fuel pool cooling; (7) inventory control; (8) reactivity control; (9) containment closure; (10) reduced inventory or midloop conditions; (11) refueling activities; (12) heatup and cooldown activities; (13) restart activities; and (14) licensee identification and implementation of appropriate corrective actions associated with refueling and outage activities. The inspectors' containment inspections included observations of the containment sump for damage and debris, and supports, braces, and snubbers for evidence of excessive stress, water hammer, or aging.

- April 5, 2007, Mid-loop Operations from the Control Room

- April 6, 2007, Spent Fuel Pool Time-to-Boil Method, In-office Review

- April 9, 2007, CAR 200703537, High Spent Fuel Pool Temperature Following Core Off-load

- April 19, 2007, Reactor Vessel Fuel Reload Activities, from the Reactor Building and Control Room

- May 4, 2007, Containment Closure Walkdown

- May 8, 2007, Reactor Startup, from the Control Room and the Outage Control Center

- May 8, 2007, Core Reactivity Balance Comparison by Boron Endpoint Measurement, Procedure ESP-ZZ-00030, Revision 1 (Surveillance 05517777)

- May 8, 2007, Moderator Temperature Coefficient Measurement at Zero Power, (Surveillance 05515418), Procedure ESP-ZZ-00009, Revision 21

- May 8, 2007, Rod Drop Testing Using the Plant Computer, (Surveillance 05514253), Procedure ESP-ZZ-00001, Revision 14

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

Failure to Implement Foreign Material Controls for the Refueling Cavity with Reactor Head Removed.

Introduction. The inspectors identified a Green noncited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when refueling operations were in progress without required foreign material exclusion barriers.

Description. Procedure APA-ZZ-00801, "Foreign Material Exclusion," Revision 24, designated the containment refueling pool as a foreign material exclusion area, FME-1. Procedure APA-ZZ-00801's FME-1 controls checklist (CA2426) specified attaching foreign material exclusion curtains to the plant north end of the reactor refueling cavity and posting the entrance to the area with a "Notice" sign. On April 19, 2007, the inspectors identified that there were no curtains acting as the north refueling cavity boundary. In addition, work on the control rod drive fan near the north end of the FME-1 area had inadequate foreign material exclusion controls. Checklist CA2426 required work group supervisors to verify that applicable foreign material exclusion measures had been established. Failure to follow the foreign material exclusion requirements could lead to the introduction of foreign material into the reactor vessel. This foreign material could create unanalyzed flow disturbances and flow blockage in the reactor core with resultant fuel cladding integrity issues.

Analysis. The performance deficiency associated with this finding was a failure of refueling personnel to follow plant procedures that establish an adequate foreign material barrier during reactor refueling operations. This finding affected the barrier integrity cornerstone objective to provide assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. This finding is greater than minor because, if left uncorrected, introduction of foreign material into the reactor cavity would become a more significant safety concern. The inspectors determined this finding to be of very low safety significance using the significance determination process for at-power reactor situations. The inspectors used the at-power significance determination process because of the concern with potential foreign material impact on an operating reactor core. This finding is of very low safety significance per Inspection Manual Chapter 0609 because the condition was a fuel barrier issue. This finding had a crosscutting aspect in the area of human performance

associated with the resources component because plant operators failed to follow procedures established to prevent the introduction of foreign material into the reactor vessel (H.4(b)).

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required that activities affecting quality 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, and drawings. Administrative Procedure APA-ZZ-00801, "Foreign Material Exclusion," Revision 24, required implementation of foreign material exclusion controls for the refueling cavity when the reactor vessel head was removed. Contrary to the above, on April 19, 2007, the written procedures established by the licensee were not implemented. Specifically, the licensee failed, during performance of the reactor fuel offload and reload, to implement foreign material exclusion control procedures. Because this issue is of very low safety significance and has been entered into the licensee's corrective action program as CAR 200704169, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000483/2007003-02, Failure to Implement Foreign Material Controls for the Refueling Cavity with Reactor Head Removed.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the FSAR, procedure requirements, and Technical Specifications to ensure that the thirteen listed surveillance activities demonstrated that the structures, systems, or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated Technical Specifications operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of American Society of Mechanical Engineers code requirements; (12) updating of performance indicator data; (13) engineering evaluations, root causes, and bases for returning tested structures, systems, or components not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciators and alarms setpoints. The inspectors also verified that AmerenUE identified and implemented any needed corrective actions associated with the surveillance testing.

- March 23, 2007, Surveillance 06532546, Steam Generator Blowdown Valve Inservice Test

- April 2, 2007, Routine Surveillance 07502824, Procedure OSP-BG-00002, Verify Component Cooling Pump A Inoperable for Cold Overpressure Mitigation System

- April 2, 2007, Routine Surveillance 05515422, Procedure OSP-SA-0018A, Train A Slave Relay K602

- April 12, 2007, Surveillances 06523017.500 and 0703806.500, Residual Heat Removal Check Valve Inservice Test

- April 17, 2007, Routine Surveillance 05517224, Procedure OTS-AL-00001, Revision 13, Train B Essential Service Water to Turbine-driven Auxiliary Feedwater Pump Flush

- April 18, 2007, Surveillance 04502339, Encapsulated Valve EJ8811A Inservice Test, Procedure OSP-EJ-V002A

- April 18, 2007, Routine Surveillance 05108705/200/500, Simulated Loss of Off-site Power and Loss of Coolant Accident

- April 19, 2007, Routine Surveillance 07504177, Pre-core Alteration Verifications

- April 19, 2007, Routine Surveillance 05516633, Fuel Reload, Procedure ETP-ZZ-0035, Revision 27

- May 1, 2007, Surveillance 07003586/900, Replacement Check Valve EMV0006 Local Leak Rate Test

- May 1, 2007, Surveillance 07003730/904, Outer Containment Butterfly Valve EFHV0031 Local Leak Rate Test, CAR 200704266

- May 8, 2007, Surveillance P701140/910 and 06523136, Inservice Test of the Turbine-driven Auxiliary Feedwater Pump and Discharge Check Valve, Procedure OSP-AL-PV005, Revision 1

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six routine, four inservice test, and two containment isolation valve samples.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls. The inspectors used the requirements in 10 CFR Part 20, the Technical Specifications, and the licensee's procedures required by Technical Specifications as criteria for determining compliance. During the inspection, the inspectors interviewed the radiation protection manager,

radiation protection supervisors, and radiation workers. The inspectors performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation packages reported by the licensee in the occupational radiation safety cornerstone
- Controls (surveys, posting, and barricades) of radiation, high radiation, or airborne radioactivity areas
- Radiation work permits, procedures, engineering controls, and air sampler locations
- Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms
- Barrier integrity and performance of engineering controls in airborne radioactivity areas
- Physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools
- Self-assessments, audits, licensee event reports, and special reports related to the access control program since the last inspection
- Corrective action documents related to access controls
- Licensee actions in cases of repetitive deficiencies or significant individual deficiencies
- Radiation work permit briefings and worker instructions
- Adequacy of radiological controls such as, required surveys, radiation protection job coverage, and contamination controls during job performance
- Dosimetry placement in high radiation work areas with significant dose rate gradients
- Changes in licensee procedural controls of high dose rate - high radiation areas and very high radiation areas
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed 20 samples.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements in 10 CFR Part 20 and the licensee's procedures required by technical specifications as criteria for determining compliance. The inspectors interviewed licensee personnel and reviewed:

- Outage or on-line maintenance work activities scheduled during the inspection period and associated work activity exposure estimates, which were likely to result in the highest personnel collective exposures
- Site specific ALARA procedures
- Integration of ALARA requirements into work procedure and radiation work permit documents
- Dose rate reduction activities in work planning
- Method for adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered
- Workers use of the low dose waiting areas
- First-line job supervisors' contribution to ensuring work activities are conducted in a dose efficient manner
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Self-assessments, audits, and special reports related to the ALARA program since the last inspection

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five of the required 15 samples and four of the optional samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Reactor Safety Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators listed below for the period from March 2006 through March 2007. The inspectors used the definitions and guidance contained in Nuclear Energy Institute 99-02, Regulatory Assessment Indicator Guideline, Revision 2, to verify the accuracy of the performance indicator data reported by AmerenUE:

- Mitigating Systems Performance Index, High Pressure Injection System
- Safety System Functional Failures

The inspectors reviewed a selection of Licensee Event Reports (LERs), portions of operator log entries, daily morning reports, the monthly operating reports, and performance indicator data sheets to determine whether AmerenUE adequately identified the number of unavailable hours for the selected systems. This number was compared to the number reported for the performance indicator during the current quarter. In addition, the inspectors also interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution.

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

.2 Occupational Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed licensee documents from October 1, 2006, through March 31, 2007. The review included corrective action documentation that identified occurrences in locked high radiation areas (as defined in the licensee's Technical Specifications), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in Nuclear Energy Institute 99-02). Additional records reviewed included as low as reasonably achievable records and whole body counts of selected individual exposures. The inspectors interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. In addition, the inspectors toured plant areas to verify that high radiation, locked high radiation, and very high radiation areas were properly controlled.

Performance indicator definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Revision 3, were used to verify the basis in reporting for each data element.

- Occupational Exposure Control Effectiveness

The inspectors completed the one required sample in this cornerstone.

b. Findings

No findings of significance were identified.

.3 Public Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed licensee documents from October 1, 2006, through March 31, 2007. Licensee records reviewed included corrective action documentation that identified occurrences for liquid or gaseous effluent releases that exceeded performance indicator thresholds and those reported to the NRC. The inspectors interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. Performance indicator definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Revision 3, were used to verify the basis in reporting for each data element.

- Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

The inspectors completed the one required sample in this cornerstone.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's corrective action program. This assessment was accomplished by reviewing the daily CAR screening report and control room logs and attending selected CAR board and work control meetings. The inspectors: (1) verified that equipment, human performance, and program issues were being identified by the licensee at an appropriate threshold and that the issues were entered into the corrective action program; (2) verified that corrective actions were commensurate with the significance of the issue; and (3) identified conditions that might warrant additional follow-up through other baseline inspection procedures.

b. Findings

No findings of significance were identified.

.2 Selected Issue Follow-up Inspection

a. Inspection Scope

In addition to the routine review, the inspectors selected the below listed issues for a more in-depth review. The inspectors considered the following during the review of AmerenUE's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

- CAR 200702394, Essential Service Water System Inoperability Following Unauthorized Work, March 15, 2007

- CAR 200702652, Essential Service Water System Inoperability Following Unauthorized Removal of a Pipe Support, March 28, 2007

- CAR 2007005489, Essential Service Water Piping Through-wall Leak, May 26, 2007, Specifically Extent of Condition Missed During Refueling Outage 15

- CARs 200609805 and 200607188, Deferral of the Residual Heat Removal Suction Relief Valves Discharge Piping Modification as Corrective Action, April 19 and April 25, 2007

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

Failure to Identify and Correct Essential Service Water Pipe Wall Thinning.

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” after AmerenUE’s extent of condition reviews to address essential service water microbiological influenced corrosion piping degradation were ineffective.

Description. AmerenUE failed to perform an adequate extent of condition review to identify and correct degraded essential service water piping. Poor material condition of the essential service water system has been a longstanding problem at the Callaway Plant, as described in NRC Integrated Inspection Report 05000483/2007002

(NCV 05000483/2007002-03). In March 2007, prior to the refueling outage, two through-wall pipe leaks occurred due to microbiological influenced corrosion. AmerenUE assessed the extent of the corrosion by performing nondestructive examination of the low flow accessible piping. The licensee identified greater than 100 locations of less than minimum wall thickness requiring either code repairs or pipe replacement. AmerenUE's plant restart evaluation, described in Operability Determination 200704465, was based on a 100 percent inspection of accessible low flow essential service water piping. AmerenUE completed the corrective actions and returned the unit to power operations on May 10, 2007. On May 26, 2007, a new through-wall leak in a low flow section of accessible piping occurred. The new through-wall leak occurred under a removable code identification band on a 30-inch pipe section. The licensee had not performed nondestructive examination under the code band during the extent of condition review because they incorrectly assumed that the code band could not be removed.

Analysis. Failure to perform an effective extent of condition review of the corroded essential service water piping was a performance deficiency. This finding is greater than minor because, if left uncorrected, this finding would become a more significant safety concern. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, this finding was determined to have very low safety significance because it affected the mitigating systems cornerstone, was both a performance and design deficiency that did not represent a loss of a safety function, and did not affect seismic, flooding or severe weather initiating events. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not thoroughly evaluate problems such that the resolution would address causes and extent of conditions, as necessary (P.1.(c)).

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures be taken to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to take action to promptly identify and correct a condition adverse to quality. Specifically, AmerenUE's extent of condition reviews during Refueling Outage 15 did not identify and correct essential service water pipe corrosion which resulted in wall thicknesses less than the minimum allowed by code requirements. Because this finding is of very low safety significance and was entered into the corrective action program (CAR 200705489), this violation is being treated as a noncited violation in accordance with Section VI.A.1 of the Enforcement Policy:
NCV 05000483/2007003-03, Failure to Identify and Correct Essential Service Water Pipe Wall Thinning.

.3 Semiannual Trend Review

a. Inspection Scope

The inspectors completed a semiannual trend review of repetitive or closely related issues that were documented in plant trend reports, problem lists, performance indicators, system health reports, quality assurance audit reports, corrective documents, and corrective maintenance documents to identify trends that might indicate the

existence of more safety significant issues. The inspectors' review consisted of the 6-month period of January through June 2007. When warranted, some of the samples extended beyond those dates to fully assess the issue. The inspectors compared and contrasted their results with the Callaway Plant Fourth Quarter Quarterly Performance Analysis Report (OQC-06-04).

1. Continued Adverse Trend in Evaluating Identified Adverse Conditions

   The NRC identified an adverse trend in problem identification and another in problem evaluation in December 2006 (Inspection Report 05000483/2006005). The NRC subsequently identified a substantive crosscutting issue in the area of problem identification and resolution during the 2007 End-of-Cycle Assessment. The substantive crosscutting issue was based on eleven NRC findings specifically related to not thoroughly evaluating problems during 2006. This adverse trend continued through the second quarter of 2007.

   - Ineffective Corrective Actions to Evaluate the Design Basis for an Ultimate Heat Sink Workaround (Section 1R04, NCV 05000483/2007003-01)

   - Failure to Identify Extent of Condition and Correct Essential Service Water Pipe Wall Thinning (Section 4OA2, NCV 05000483/2007003-04)

2. Licensee Identified Continued Adverse Trend in Foreign Material Exclusion Controls

   The licensee identified an adverse trend associated with the foreign material exclusion program implementation. Examples included:

   - CAR 200508796, 18 Examples of Foreign Material Exclusion Program Inadequacies During Refueling Outage 14

   - CAR 200700319, Adverse Trend of Foreign Materials in Containment

   - CAR 200703858, Foreign Material Found Under the Insulation During the Bare Metal Visual Examination of the Reactor Vessel Head

   - CAR 200703984, Foreign Material in High Pressure Feedwater Heater Inlet Piping

   - CAR 200704185, Foreign Material Found During Train A Essential Service Water Supply and Discharge Piping Inspections

   - CAR 200704169, Job Stopped due to Unsatisfactory Foreign Material Exclusion Control Near Refueling Pool

   - CAR 200704369, Foreign Material Found in the Upper Reactor Cavity During Cavity Decon

   - CAR 200704690, Adverse Trend in use of Foreign Material Exclusion Checklists During Pre-job Briefs

- CAR 200704692, APA-ZZ-00801 Procedural Guidance Unclear for Pre-Job Briefings

- CAR 200704693, Lack of Foreign Material Exclusion Observations for Supplemental Personnel During Refueling Outage 15

- CAR 200704694, Quality Assurance Self-assessment SA07-MM-F01, Identified Training Needed for Foreign Material Exclusion Pre-job Briefs

- CAR 200704846, Items Discovered on the May 4, 2007, NRC Containment Closeout Inspection

3. Licensee Identified Continued Adverse Trend in Calculation Errors

AmerenUE identified an adverse trend in calculation deficiencies. The annual number of deficient calculations increased 67 percent from June 2006 to June 2007. The licensee determined the increase was due to the newly established Calculation Review Project. During the last year, 306 calculations were reviewed and only 52 (17 percent) were found acceptable. Minor issues described as missing references, out-of-date references, and references superceded accounted for 199 of the deficient calculations.

The inspectors completed three semiannual trend samples.

b. Findings

No findings of significance were identified.

.4 Operator Workaround Review

a. The inspectors conducted one operator workaround review to verify that the licensee is identifying operator workaround problems at an appropriate threshold and entering them into the corrective action program and that the licensee has proposed or implemented appropriate corrective actions.

- April 3, 2007, Uncontrolled Workaround Resulted in Subjecting the Ultimate Heat Sink Cooling Tower to Freezing Conditions

The inspectors completed one workaround sample.

b. Findings

One finding of significance was identified and is described in Section 1R04 of this report.

.5 Radiation Safety

The inspectors evaluated the effectiveness of the licensee's problem identification and resolution process with respect to the following inspection areas:

- Access Control to Radiologically Significant Areas (Section 2OS1)
- ALARA Planning and Controls (Section 2OS2)

Documents reviewed by the inspectors included:

- Quality Assurance Surveillance Report SP07-015, Assessment of Corrective Actions for Essential Service Water Pipe Support Removal

The inspectors completed two samples.

4OA3 Event Followup (71153)

.1 (Closed) LER 05000483/2007-001-00, Single Train Inoperability in the Essential Service Water System due to Inadequate Valve Closure Settings

On February 7, 2007, the licensee identified that one essential service water train had been inoperable for an extended duration. The train was inoperable because of excessive leakage across the isolation valve (Valve EFHV0025) which separated the essential service water system from the normal service water system. The licensee determined that the leakage was caused by a misadjusted limit switch on the valve operator. The adjustment to ensure valve disk and valve seat are properly mated when a valve operator reaches the closed position was not correctly controlled by the maintenance program. Corrective actions to the maintenance program have been initiated. During the period of time that excessive seat leakage existed on Valve EFHV0025, the required essential service water isolation function would have been performed by the redundant essential service water Valve EFHV0023. The inspectors documented the Technical Specification violation in Section 4OA7 of this report. No additional findings of significance were identified. This LER is closed.

.2 (Closed) LER 05000483/2007-002-00, Manual Reactor Trip due to Inadequate Feedwater Control

On March 9, 2007, AmerenUE operations personnel manually tripped the reactor during a rapid reactor power reduction initiated to address a main condenser tube rupture. The licensee determined that a steam generator level transient, which occurred due to a mechanical failure of a main feedwater regulation valve positioner, necessitated the reactor trip. Corrective actions involved repairs to the condenser tube and the main feedwater regulation valve. The inspectors reviewed the LER and no findings of significance were identified. This LER is closed.

.3 (Closed) LER 05000483/2006-009-00, Inadequate Application of Technical Specifications Related to Main Steam Isolation Valves and Actuator

On January 26, 2007, AmerenUE reported that Callaway Plant Technical Specification 3.7.2 did not explicitly address main steam isolation valve actuator trains. The LER acknowledged that Technical Specification 3.7.2 had been inadequately applied for past instances of actuator train inoperability and that the NRC had issued a Green NCV for such maintenance in December 2004. This was documented as NRC Inspection Report NCV 05000483/2006012-03, Inadequate Operability Determination of a Degraded Main Steam Isolation Valve. Corrective actions involved requesting and receiving License Amendment 172 which was issued on June 16, 2006. Additional changes were also made to the FSAR and operating procedures. The inspectors reviewed the LER and no additional findings of significance were identified. This LER is closed.

4OA5 Other Activities

.1 (Discussed) NRC Temporary Instruction 2515/166, Pressurized Water Reactor Containment Sump Blockage

a. Inspection Scope

From April 2-12, 2007, the inspectors reviewed the licensee's implementation of plant modifications and design modification packages associated with their response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors." The inspectors observed postinstallation work activities and reviewed various aspects of the on-going procedural changes. In addition, those changes were verified to be properly documented in accordance with the requirements of 10 CFR 50.59. At the completion of this inspection, the licensee was in the final installation stages of the new sump strainers and most of the changes associated with the modifications had not been completed.

The inspectors compared and evaluated the recirculation sump modifications to the original design basis using Temporary Instruction 2515/166 and referred to Regulatory Guide 1.82, Revision 0, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident."

As a result of the inspectors' questioning, the licensee developed a white paper to address the licensee commitment regarding evaluation and implementation of potential safety injection system modification based on downstream effects. The licensee determined that safety injection throttle valves are not susceptible to blockage; however, because there are key industry evaluations on the downstream effects which have yet to be completed, the potential to modify the safety injection system will be dependent on the results of those evaluations. Other commitments were reviewed by the inspectors, but their implementation dates were beyond the completion date of this inspection.

Two of the commitments were scheduled to be implemented at the end of Refueling Outage 15 and were associated with specific physical modifications (i.e. new sump strainers and debris barriers). From May 2-4, 2007, the resident inspectors observed the installation of sump strainers and debris barriers during their containment walkdown. The installation of the sump strainers and debris barriers were verified to be in accordance with design requirements.

At the end of the inspection, just 4 of the 22 commitments were able to be verified by the inspectors. Most of the licensee commitment completion dates are scheduled to occur after the outage end date. The Office of Nuclear Reactor Regulation will determine the adequacy of the sump modifications with respect to Generic Safety Issue 191, and the final review and acceptance of chemical and downstream effects will be completed later. This temporary instruction remains open.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 (Closed) NRC Temporary Instruction 2515/150, Reactor Pressure Vessel and Vessel Head Penetration Nozzles

a. Inspection Scope

As part of the visual inspection activity, the resident inspectors reviewed one of the three bare metal visual videotapes to verify head cleanliness. No issues were identified.

During the inspection, the licensee conducted ultrasonic examinations on approximately 37 of the 78 control rod drive mechanism penetrations. During this volumetric inspection activity, the inspectors were able to observe portions of the ultrasonic examinations. In addition, the inspectors reviewed the completed examination reports on the 11 penetrations identified in the table in Section 1R08.1 of this report.

The inspectors raised a question with respect to extent of ultrasonic examination coverage based on operating stress levels. The licensee had implemented the approved Relaxation Request for Alternate Examination Coverage of the First Revised Order EA-03-009, which allowed a reduced examination volume to one inch below the lowest point at the toe of the J-groove weld and including all reactor pressure vessel head penetration nozzle surfaces below the J-groove weld that have an operating stress level of 20 ksi tension or greater.

The licensee provided Dominion Engineering Calculation C-4184-00-01, Callaway Upper Head CRDM Nozzle Welding Residual Stress Analysis," Revision 0, dated March 1, 2007. This calculation presented the elevations at which stresses decay to 20 ksi at the downhill, midplane, and uphill location of each nozzle, using as-designed geometry. The licensee chose to use the order-required 2.0 inch uphill dimension, but a

1.44 inch dimension for nozzles 1-5, a 1.1 inch dimension for nozzles 6-21, and a 1.0 inch dimension for nozzles 22-78. These dimensions were based on the calculated elevations at which the operating stresses decayed to 20 ksi.

The inspectors further verified that the qualified procedures used by the contractor (AREVA) to perform the ultrasonic examinations (identified in the attachment) clearly accounted for the calculated dimensions. During observation of the examinations, the inspectors verified that the procedures were being implemented by qualified Level II personnel. No indications, other than manufacturing type indications (e.g., machining), were identified. This temporary instruction is closed.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the results of the inservice inspection, containment sump modifications, and the reactor vessel head inspection to Mr. T. Herrmann, Vice President, Engineering, and other members of licensee management on April 12, 2007. The licensee acknowledged the issues and observations presented. It was also communicated to the licensee's management staff that the containment sump modification inspection could not be completed, and a final exit will occur at a later date pending NRR's final acceptance of the licensee's commitments to Generic Letter 2004-02.

On April 27, 2007, the inspectors presented the occupational radiation safety inspection results to Mr. T. Herrmann, Vice President, Engineering, and other members of his staff who acknowledged the findings.

On June 22, 2007, the resident inspectors presented the results of their inspection to Mr. C. Naslund, Senior Vice President and Chief Nuclear Officer and other members of his staff who acknowledged the findings.

On July 23, 2007, the resident inspectors presented a change to the results of their inspection Mr. D. Neterer, Superintendent of Operations, who acknowledged the change.

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements, which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as noncited violations.

- The inspectors reviewed three examples of the failure to follow station procedures associated with access control to radiologically significant areas. Technical Specification 5.4.1 states that written procedures shall be established,

implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33, Appendix A, Section 7.e(1) stipulates procedures for access control to radiation areas. Procedure APA-ZZ-01004, "Radiological Work Standards," Revision 7, Section 4.3.1.a, states, "ENSURE you adhere to instructions on [radiological posting] sign and your radiation work permit." Section 4.3.1.c, states, "Do NOT defeat, remove or alter radiation protection boundaries, barricades, or radiological postings." Contrary to these requirements, on three occasions the licensee identified workers that did not adhere to the instructions on radiological posting signs and their radiation work permit. Specifically, on April 3, 2007, four contract workers did not adhere to the instructions when they were observed entering the posted radiation/contamination area in street clothing. On April 8, 2007, radiation protection personnel discovered four contract workers that did not adhere to the instructions in a radiation/contamination area when they entered the area without protective clothing. Additionally, on April 5, 2007, a worker was observed moving radiological boundaries. The inspectors determined that the finding was of very low safety significance because: (1) it was not an ALARA finding, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. These events are in the licensee's corrective action program as CARs 200703189, 200703333, and 200703492.

- Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures be established to assure that conditions adverse to quality, such as deviations and nonconformances are promptly identified and corrected. Technical Specification 3.4.2 listed the minimum allowed reactor coolant system temperature while critical as 551 degrees Fahrenheit. On October 23, 2003, a plant transient resulted in reactor coolant system temperature decreasing approximately 2 degrees below 551 degrees Fahrenheit. The Technical Specification action statement allowed 30 minutes to be in Mode 2 with a subcritical reactor. The transient caused the reactor to become subcritical. The operators procedural guidance expected the operators to be able to control reactor coolant system temperature and maintain reactor power stable using control of steam loads to establish a reactor critical condition of about 5 e^{-6} amps. In a 20 minute period the reactor transitioned through five decades of power decrease due to the transient. No attempts were made to restore power and after two hours the procedural requirement to insert control rods was implemented. Thirty eight days later a corrective action document (CAR) identified the Technical Specification entry and unplanned power decrease.

  Contrary to the above, identification in the form of an operator log entry and condition adverse to quality document (CAR) were not promptly generated to capture and correct the cause and impact of the transient. Training improvements associated with Mode 2 operations were delayed until 2007 when CAR 200702601 was initiated. This finding is of very low safety significance because the finding does not contribute to both the likelihood of a

reactor trip and the likelihood that mitigating equipment or functions will not be available. The licensee's corrective action program has now addressed the plant operation issues.

- Technical Specification 3.7.8 requires that the essential service water system be maintained operable. Contrary to this requirement, on February 7, 2007, the licensee identified that one essential service water train had been rendered inoperable for an extended duration due to a misadjusted limit switch on the valve operator for Valve EFHV0025. This adjustment, to ensure valve disk and valve seat are properly mated when a valve operator reaches the closed position, was not correctly controlled by the maintenance program. This finding is of very low safety significance because it did not represent an actual loss of safety function of a single train for greater than its allowed outage time and was not risk significant due to seismic, flooding, or a severe weather event. Corrective actions to address the maintenance program deficiency have been initiated. This finding was discussed in Section 4OA3 for LER closure.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Brandes, Design Engineer
B. Corder, System Engineer
F. Diya, Plant Director
J. Doughty, Boric Acid Corrosion Control Engineer
R. Farnam, Manager, Radiation Protection
K. Gilliam, Supervisor, Radiation Protection
T. Herrmann, Vice President, Engineering
B. Huhmann, Supervisor, Engineering
L. Kanuckle, Manager, Quality Assurance
R. Lutz, Design Engineer
S. McCracken, Welding Engineer
S. Meyer, Supervising Engineer, Quality Assurance
B. Montgomery, Inservice Inspection Engineer
T. Moser, Manager, Plant Engineering
D. Neterer, Manager, Operations
T. Parker, Trainer, Radiation Protection
S. Petzel, Engineer, Regional Regulatory Affairs
S. Reed, Supervisor, Engineering
D. Stepanovich, Supervising Engineer, Technical Support

Other:

R. Underwood, ANII, Hartford Steam Boiler Inspection and Insurance Company of Connecticut

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000483/2007003-01	NCV	Ineffective Corrective Actions to Evaluate the Design Basis for an Ultimate Heat Sink Workaround (Section 1R04)
05000483/2007003-02	NCV	Failure to Implement Foreign Material Controls for the Refueling Cavity with Reactor Head Removed (Section 1R20)
05000483/2007003-03	NCV	Failure to Identify and Correct Essential Service Water Pipe Wall Thinning (Section 4OA2)

Closed

05000483/2007-001-00	LER	Single Train Inoperability in the Essential Service Water System Due to Inadequate Valve Closure Settings (Section 4OA3)
05000483/2007-002-00	LER	Manual Reactor Trip Due to Inadequate Feedwater Control (Section 4OA3)
05000483/2006-009-00	LER	Inadequate Application of Technical Specifications Related to Main Steam Isolation Valves and Actuator (Section 4OA3)
2515/150	TI	Reactor Pressure Vessel and Vessel Head Penetration Nozzles (Section 4OA5)

Discussed

2515/166	TI	Pressurized Water Reactor Containment Sump Blockage (Section 4OA5)

DOCUMENTS REVIEWED

Section 1R08: Inservice Inspection Activities

Procedures

AUE-UT-98-1, Manual Ultrasonic Examination of Ferritic Piping Welds, Revision 1

EDP-BB-01341, Steam Generator Surveillance, Revision 1

EDP-ZZ-01003, Inservice Inspection Program, Revision 21

EDP-ZZ-01004, Boric Acid Corrosion Control, Revision 4

ETP-BB-01309, Steam Generator Eddy Current Testing Acquisition and Analysis Guidelines, Revision 17

MTW-ZZ-WP003, Control of Welding Filler Materials, Revision 0

PCI-WCP-3, Welding Material Control, Revision 8

PDI-UT-1, PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds, Revision C

QCP-ZZ-01002, Qualification of Quality Control Personnel for Inspection Activities, Revision 16

QCP-ZZ-05000, Liquid Penetrant Examination, Revision 17

QCP-ZZ-05010, Magnetic Particle Examination, Revision 13

QCP-ZZ-05042, Visual Examination to ASME VT-3, Revision 16

QEP 20.05, Welding Material Control, Revision 5

AREVA Procedures

54-ISI-604-002, Automated Ultrasonic Examination of Open Tube Reactor Pressure Vessel Closure Head Penetrations, January 30, 2007

54-ISI-603-003, Automated Ultrasonic Examination of Reactor Pressure Vessel Closure Head Penetrations Containing Thermal Sleeves, January 20, 2007

Welding Procedure Specification, Revision, and Procedure Qualification Record

8MN-GTAW/SMAW, Revision 15, 063 and 600
8-F43-GTAW, Revision 4, 481 and 690
3-8/52-TB MC-GTAW-N638, Revision 7, 677, 750, 770
8 MC-GTAW, Revision 10, 046, 062, 600

Drawings

10017D79, Pressurizer Surge Nozzle Welding Layer Process Map, Revision 1

10017D80, Pressurizer Spray Nozzle Welding Layer Process Map, Revision 1

10017D81, Pressurizer Safety Nozzle Welding Layer Process Map, Revision 1 (2-TBB03-3-A-W)

10018D02, Pressurizer Safety Nozzle Welding Layer Process Map, Revision 1 (2-TBB03-3-B-W)

10018D01, Pressurizer Safety Nozzle Welding Layer Process Map, Revision 1 (2-TBB03-3-C-W)

10018D03, Pressurizer Relief Nozzle Welding Layer Process Map, Revision 1 (2-TBB03-4-W)

10019513, ASME/Axial/Circ EDM Standard, Revision 1

9043947B, Wear Flaw Calibration Standard As-built Drawing, Revision 0

Callaway Action Requests

200510316	200600295	200601263
200602580	200603745	200606821
200610436	200702384	200703611

Nonconformance Reports

PCI Energy Services, 900708-05

Certified Material Test Reports (CMTRs for Welding Materials)

3/32" ER 309/309L-16, Lot 5F10C-10A
5/32" ER 309L-16, Lot 9D14E-14A
5/32" E-7018, Lot 2E2 15A01
1/8" E-7018, Lot 4K226C02
3/32" E-7018, Lot 2A507C01
3/32" x 36" E309L, Lot CT7208

Miscellaneous

Training and testing qualification/certification packages for nondestructive examination personnel

Callaway Plant 10 CFR 50.55a Request for Relief - Proposed Alternatives for Application of Structural Weld Overlays to Pressurizer Nozzle Welds, Attachment to ULNRC-05292

Dominion Engineering, Inc. Letter L-4183-00-1 to Mr. Gregory A. Harris, AmerenUE, regarding "Preliminary JCO of ESW Pump-House Piping Near V094," dated March 16, 2007

Reedy Engineering, Inc. Letter UEL 07-002 to Mr. Richard Lutz, AmerenUE regarding "Pipe Wall Thinning," dated March 16, 2007

Callaway Plant Inservice Inspection Program Plan, October 12, 1994

Operating Instruction 55-010053-01, Narrow Groove Gas Tungsten Arc Welding - Heavy Wall Stainless Steel Piping, July 6, 2005

Calculation C-4181-00-01, Callaway Upper Head CRDM Nozzle Welding Residual Stress Analysis, Revision 0

Weld Overlay Process Traveler Including Sulfur Mitigation for Pressurizer Surge Nozzle - TBB03

Weld Overlay Process Repair Traveler, "Manual Repair of Base Metal"

ASME Code Case N-513-1

ASME Code Case N-504-2

ASME Code Case N-638-1

NRC Generic Letter GL 90-05, "Guidance for Performing Temporary Non-Code Repair of Class 1, 2, 3 Piping"

Engineering Information Record 5062980-00, Technical Summary of Callaway Plant Replacement Steam Generator Pre-service Eddy Current Inspection, March 2005

Engineering Information Record 9042136-00, Callaway Unit 1, 1R15- EPRI, Appendix H, Eddy Current Technique Review, March 30, 2007

Engineering Information Record 9034988-001, Callaway EOC 15 Steam Generator Degradation Assessment, April 9, 2007

UEND-Strategy-02. Steam Generator Strategic Plan for Callaway, 2006

Examination Technique Specification Sheet ETSS #1, Revision 0

Section 1R12: Maintenance Effectiveness

Callaway Action Requests

200600469	200603749	200603883	200605432
200702160	200703132	200704160	200604407
200705059	200705132		

Procedures

EDP-ZZ-01128, Appendix 2, Summary of SSC Performance Criteria, Revision 5

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

EDP-ZZ-01129, Callaway Plant Risk Assessment, Revision 12
OTN-BB-00002, Reactor Coolant System Draining, Revision 35
OTO-EJ-00001 Loss of Residual Heat Removal Flow, Revision 24

Callaway Action Requests

200703323
200703378

Miscellaneous

Callaway Refuel 15 Analysis, February 15, 2007

Technical Specification Bases B3.9.4 discussion of administrative controls allowing an open equipment hatch during core alterations

Section 1R20: Refueling and Outage Activities

Procedures

ESP-ZZ-00001, Rod Drop Testing Using the Plant Computer, Revision 14

ESP-ZZ-00009, Moderator Temperature Coefficient Measurement at Zero Power, Revision 21

ESP-ZZ-00030, Core Reactivity Balance Comparison by Boron Endpoint Measurement, Revision 1

OTN-BB-00001, Reactor Coolant System - IPTE for Vacuum Fill of the Reactor Coolant System, Revision 21

OTN-BB-00002, Reactor Coolant System Draining, Revision 35

OTO-EJ-00003, Loss of RHR While Operating at Reduced Inventory or Mid-loop Conditions, Revision 0

OTO EJ-00001, Off-Normal Operating Procedure - Loss of RHR Flow, Revision 24

OTG-ZZ-0003, Plant Startup Hot Zero Power to 30 Percent Power - IPTE, Revision 36

OTG-ZZ-00006, Plant Cooldown Hot Standby to Cold Shutdown, Revision 44

Callaway Cycle 16 Reload Safety Evaluation, Revision 1, March 2007

Callaway Action Requests

CAR 200604465

Section 1R22: Surveillance Testing

Procedures

OSP-SF-00003, Pre-core Alteration Verifications, Revision 15

ETP-ZZ-0035, Refueling Performance - IPTE, Revision 27

APA-ZZ-00365, Callaway Plant Lifting Operations, Revision 0

ESP-SM-01001, Containment Leakage Rate Test Program, Revision 20

OSP-EF-LL071, Containment Isolation Valve Leakage Rate Test, Revision 8

OSP-EJ-V0002, Residual Heat Removal and Reactor Coolant System Check Valve Inservice Test, Revision 24

OSP-EJ-V002A, Residual Heat Removal Pump Containment Sump Suction and Residual

Water Storage Tank Suction Inservice Test, Revision 23

ISL-NF-NB01B, NB01 Degraded and Undervoltage to Load Shedding/Emergency Load Sequencing Channel II, Revision 18

OSP-BM-V0001A, Steam Generator Blowdown System Valve Operability, Revision 12

Section 2OS1 and 2OS2: Access Controls to Radiologically Significant Areas and ALARA Planning and Controls

Callaway Action Requests

200608084	200609985	200610486	200701211
200701457	200701832	200701893	200701940
200702127	200702750	200702886	200702899
200702939	200702967	200703189	200703209
200703333	200703385	200703467	200703479
200703492	200704362	200704363	200704509
200704514			

Audits and Self-Assessments

AP07-001, Radiation Protection

Radiation Work Permits

05516939520, Removal of old flux map detectors from the seal table
06116789, Inspect the bottom of the reactor vessel
751520DECONLWR, Decon the lower refueling cavity

Work in Progress Reviews

790560HRALLRT, Local leak rate tests
07000690100, Build/Remove scaffolding
06114483, Replace Essential Service Water Supply and Return Piping, Revision 1
06114483, Replace Essential Service Water Supply and Return Piping, Revision 2

Procedures

APA-ZZ-01000, Callaway Plant Radiation Protection Program, Revision 24
APA-ZZ-01004, Radiological Work Standards, Revision 7
HDP-ZZ-01500, Radiological Postings, Revision 22
HTP-ZZ-01203, Radiological Area Access Control, Revision 34
HTP-ZZ-06001, High Radiation/Very High Radiation Area Access, Revision 25
HTP-ZZ-06028, Radiological Controls for Pools that Contain or Store Spent Fuel, Revision 5

Section 4OA2: Identification and Resolution of Problems

Procedures

APA-ZZ-00500, Appendix 17, Screening Process Guidelines, Revision 0
OTN-EF-00001, Essential Service Water System, Revision 31

Callaway Action Requests

200306252	200505716	200604872	200607252
200703279	200703584		

Miscellaneous

Calculation EF-54, S726-Steam Generator Team, Revision 2

Vendor Manual M-015-U0049, Marley Cooling Tower Operating Manual, Order Number 12-451

Quality Assurance Surveillance Report SP07-025, Evaluate essential service water repair/replacement activities, May 21, 2007

Operability Determination 200704465, Acceptability of Essential Service Water System for Cycle 16 Operation, May 4, 2007

Section 4OA5: Other Activities

Calculations

EC-PCI-WC/CAL-6002/6003-1001 (Coversheet), AES Documents No. PCI5304-S01, Revision 1

Structural Evaluation of the Containment Sump Strainers, Revision 0

PCI-53040S01, Structural Evaluation of the Containment Sump Strainers, Revision 1

EJ-29, NPSH Margin for Residual Heat Removal Pumps at Transition to Recirculation when NPSH Margin is at its Minimum Value, Revision 1

EN-13, NPSH Margin for Containment Spray Pumps at Transition to Recirculation when NPSH Margin is at its Minimum Value, Revision 0

BG-75 ADD 2-00, Impact of MP 06-0003, Replacement Containment Recirculation Sump Strainers, and MP 06-0027 TSP Basket Relocation on BG-75, Revision 0

BN-21 ADD 2, Impact of MP 06-0003, Replacement Containment Sump Strainer on BN-21 Revision 0

BN-22 ADD 2, Impact of MP 06-0003, Replacement Containment Sump Strainer on BN-22 Revision 0

EM-19 ADD3, Impact of MP 06-0003, Replacement Containment Recirculation Sump Strainers, and MP 06-0027, TSP Basket Relocation on EM-19, Revision 0

Evaluations and Engineering Reports

MP-0003, Engineering Disposition - Replacement Containment Emergency Recirculation Strainers, Revision 0

MP 06-0003, Engineering Screen: Hazards Review - Replacement Sump Strainers, Revision 0

MP 06-0003, Engineering Screen: Programs Review - Replacement Containment Sump Strainers, Revision 0

MP 06-0003, Recommended Preventative Maintenance, Revision 0

Maintenance Procedures

MP 06-0027, Relocate Trisodium Phosphate Dodecahydrate Baskets, Revision 0

MP 06-0029, Remove Instrumentation EJ-LE-7A and EJ-LE-8A from the Containment Recirculation Sumps, Revision 0

MP 06-0047, Debris Barrier in Containment Loop Access Doors A and D, Revision 0

Procedures

APA-ZZ-00801, Foreign Materials Exclusion, Revision 24
OSP-EJ-V0002, RHR and RCS Check Valve Inservice Test - IPTE, Revision 24
OSP-EJ-00003, Containment Recirculation Sump Inspection, Revision 5
OSP-EN-V0002, Containment Spray Encapsulated Isolation Valve Inservice Test, Revision 14
OSP-SA-00004, Visual Inspection of Containment for Loose Debris, Revision 18

Applicability Determination

MP 06-0003, Replace containment sump screens (FEN01A/B) with strainers, Revision 0

50.59 Screens

MP 06-0003, Replace Callaway Containment Emergency Recirculation Sump Strainers, Revision 0

MP 06-0029, Modify the Containment Recirculation Sump Level Instrument Loops EJL0007 and EJL0008, Revision 0

50.59 Evaluation

MP 06-0029, Modify Recirc Sump Level Sensor, Revision 0

Callaway Action Requests

200304409
200606889

Engineering Change Notices

C-1016-00024	C-131-05671	C-131-05672
C-131-05673	C-131-05674	C-131-05675
C-131-05677		

Presentations & Memorandums

Brief Overview of Replacement CTMT Sump Strainers, September 8, 2006

Callaway Plant, Unit 1 - Issuance of Amendment No. 180 Regarding Containment Sump Strainers and Relocating TSP-C Baskets (TAC No. MD2363), February 21, 2007

White paper discussing SI throttle valve modification at Callaway, April 6, 2007

Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Commitment Status for NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors;" ULNRC-05235, December 12, 2005

Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License-NPF-30 Response to Generic Letter 2004-02: "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors;" ULNRC-05295, May 30, 2006

Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Response to Generic Letter 2004-02: "Potential Impact of Debris Blockage on Emergency Recirculation During Design;" ULNRC-05194, September 1, 2005

Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Response to Generic Letter 2004-02: "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors;" ULNRC-05124, March 7, 2005