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

August 5, 2008

EA-08-190

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

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION
REPORT AND NOTICE OF VIOLATION 05000483/2008003

Dear Mr. Heflin:

On June 24, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Callaway Plant. The enclosed report documents the inspection results, which were discussed on June 24, 2008, with you and other members of your staff.

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

Based on the results of this inspection, one violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding this violation are described in detail in the enclosed report. The violation involved failure to implement corrective actions to preclude the repetition of void formation in the emergency core cooling piping (EA-08-190). Although determined to be of very low safety significance (Green), this violation is being cited because one of the criteria specified in Section VI.A.1 of the NRC Enforcement Policy for a noncited violation was satisfied. Specifically, AmerenUE failed to restore compliance within a reasonable time after the violation was last identified in NRC Inspection Report 05000483/2006002-012. Please note that you are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

This report also documents four NRC-identified and self-revealing findings of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. Additionally, two licensee-identified violations which were determined to be of very low safety significance are listed in this report. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as NCVs consistent with Section VI.A of the NRC Enforcement Policy. If you contest these NCVs, 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, 612 East Lamar Drive, Suite 400, Arlington, Texas 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at the Callaway Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures 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), 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,
Projects Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

Enclosures: Notice of Violation and
NRC Inspection Report 05000483/2008003
w/attachment: Supplemental Information

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SUNSI Review Completed: VGG ADAMS: ☑ Yes □ No Initials: VGG
☑Publicly Available □ Non-Publicly Available □ Sensitive ☑Non-Sensitive
R:_Reactors_CW\2008\CW 2008003RP-DED.doc ML 082180851

RIV:SRI:DRP/B	C:DRS/OB	C:DRS/PSB1	C:DRS/EB2	C:DRS/EB1
DDumbacher	RELantz	MPShannon	NFO'Keefe	RLBywater
/RA/ VGGaddy for	***/RA/***	***/RA/***	***/RA/ MFRunyan for***	***/RA/***
07/29/2008	07/9/2008	07/14/2008	07/15/2008	07/11/2008
C:DRS/PSB2	**DRS/SRA**	**ACES**	**C:DRP/B**	**D:DRP**
GEWerner	DPLoveless	GMVasquez	VGGaddy	DDChamberlain
/RA/	***/RA/***	***/RA/***	***/RA/***	***/RA/***
07/17/2008	07/15/2008	07/24/2008	08/5/2008	07/28/2008

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NOTICE OF VIOLATION

AmerenUE
Callaway Plant

Docket 50-483
License NPF-30
EA-08-190

During an NRC inspection conducted March 24 through June 24, 2008, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that "measures shall be established to ensure that, for significant conditions adverse to quality, the cause of the condition is determined and corrective action taken to preclude repetition."
>
> Contrary to this, from December 26, 2006, through May 21, 2008, the licensee failed to take corrective actions to preclude repetition of safety-related emergency core cooling system pipe voiding, and the licensee determined that this condition was a significant condition adverse to quality.

This violation is associated with a Green Significance Determination Process finding.

Pursuant to the provisions of 10 CFR 2.201, AmerenUE is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region IV, and a copy to the NRC Senior Resident Inspector at the facility that is the subject of this Notice of Violation (Notice), within 30 days of the date of the letter transmitting this Notice. This reply should be clearly marked as a "Reply to Notice of Violation EA-08-190," and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in

detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated this 5th day of July 2008

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-483
License:	NPF-30
Report:	05000483/2008003
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, MO
Dates:	March 25 - June 24, 2008
Inspectors:	D. Dumbacher, Senior Resident Inspector J. Groom, Resident Inspector J. Drake, Senior Reactor Inspector, Plant Support, Branch 2 G. Guerra, CHP, Health Physicist, Plant Support Branch 1
Approved By:	V. Gaddy, Chief, Project Branch B Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000483/2008003: 3/25 - 6/24/2008; Callaway Plant, Operability Evaluations, Postmaintenance Testing, Surveillance Testing, and Identification and Resolution of Problems.

This report covered a 3-month period of inspection by resident inspectors. 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 for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of Technical Specification 3.5.2, "Emergency Core Cooling Systems," after an inadequate surveillance procedure resulted in the licensee failing to maintain the emergency core cooling system full of water as required per Technical Specification 3.5.2. On May 21, 2008, Callaway Plant engineering discovered that a section of the cold leg recirculation piping, specifically the discharge of the residual heat removal pumps to the safety injection pumps, contained 6.6 cubic feet of air. Callaway monthly surveillance Procedure OSP-SA-00003, "Emergency Core Cooling Flow Path Verification and Venting," had a purpose to: "Verify the ECCS is full of water," in accordance with Technical Specification Surveillance Requirement 3.5.2.3. The monthly verification and vent procedure was not comprehensive enough to ensure all the emergency core cooling system was full of water.

  This finding was more than minor because it was similar to Example 3e of NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and met the "Not Minor If," criteria because the failure to meet the licensee's administrative requirement for allowable void fraction impacted the ability of the Train A safety injection system to function upon initiation of high-pressure recirculation. This finding affected the mitigating systems cornerstone procedure quality attribute. Using the Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined that this finding should be evaluated using the Phase 2 process described in Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." As described in Section III, of Appendix A, given that the presolved table did not contain a suitable target or surrogate for this finding, the senior reactor analyst used the risk-informed notebook to evaluate the significance of this finding affecting only high-pressure recirculation as very low risk significance (Green). This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and did not adopt a requirement to demonstrate that a single vent valve was sufficient to vent the affected line rather than assuming that an additional

installed valve was not necessary to completely fill, vent, and test the line [H.1(b)] (Section 1R15).

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified after the licensee failed to promptly correct leakage from diesel generator jacket water o-rings. On February 20, 2008, during a normal surveillance run of Emergency Diesel Generator B, Callaway operations personnel identified an approximately 80 drop-per-minute jacket water leak caused by premature failure of Nitrile type o-rings. Following restoration of Emergency Diesel Generator B, the licensee re-evaluated the preventative maintenance frequency for jacket water o-ring replacement and reduced the replacement frequency from once every 3 years to once every refueling cycle. Then, on May 28, 2008, during a routine surveillance run of Emergency Diesel Generator A, Callaway operations personnel identified that Emergency Diesel Generator A had a 200 drop-per-minute jacket water leak. Similar to the condition observed on Emergency Diesel Generator B on February 20, 2008, the source of the leakage was from Nitrile type o-rings within the jacket water system. The o-rings responsible for jacket water leakage were found to be of similar age to those that failed during the February 20, 2008, surveillance but had not been replaced despite the change to the licensee's preventive maintenance frequency.

  This finding, failure to implement adequate corrective actions for degraded Nitrile type o-rings in Emergency Diesel Generator A after previously identifying the adverse condition on Emergency Diesel Generator B, was more than minor because, if left uncorrected, degraded diesel generator jacket water o-rings could become a more significant safety concern. This finding affected the mitigating systems cornerstone. Using Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” this finding was determined to be of very low safety significance because it was a design deficiency confirmed not to result in loss of operability. This finding has a crosscutting aspect in the area of human performance associated with the work controls component because the licensee failed to plan work activities to support long-term equipment reliability by addressing known degraded conditions in a more reactive than preventative manner [H.3(b)] (Section 1R19).

- Green. The inspectors identified a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," because the licensee failed to take corrective actions to preclude repetition of void formation in emergency core cooling system piping, a significant condition adverse to quality. After experiencing void formations in 2005 and 2006, the NRC identified violations of Criterion XVI. However, licensee corrective actions did not preclude repetition of void formations that were discovered on May 21, 2008. On that date, Callaway Plant engineering performed ultrasonic inspection of the safety injection system common suction piping Line EM023-HCB – 6" and discovered a 6.6 cubic foot voided area. This exceeded the allowable void fraction of 2.1 cubic feet required for operability. This voided piping, determined to have existed for over a year, was caused by relief valve maintenance on Valve EM8858A (May 7, 2007). The maintenance restoration failed to perform an adequate fill and vent to ensure the suction pipe was full of water. The inspectors identified several related examples where the licensee had performed either inadequate operating experience

evaluations, inadequate extent of condition reviews, or inadequate procedure corrections. The violation is being cited in a Notice of Violation because the licensee failed to restore compliance with a reasonable time after a violation was last identified in 2006.

This finding, failure to restore compliance to prevent recurrence of emergency core cooling system voids, was more than minor because it is similar to Example 3e of NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," criteria because the failure impacted the ability of the emergency core cooling system to function upon initiation of high-pressure recirculation. Using the Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” the inspectors determined that this finding should be evaluated using the Phase 2 process described in Manual Chapter 0609, Appendix A, “Determining the Significance of Reactor Inspection Findings for At-Power Situations.” As described in Section III, of Appendix A, given that the presolved table did not contain a suitable target or surrogate for this finding, the senior reactor analyst used the risk-informed notebook to evaluate the significance of this finding as very low risk significance (Green). This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because AmerenUE failed to thoroughly evaluate voiding problems such that the resolutions addressed causes and extent of condition, as necessary [P.1(c)] (Section 4OA2).

Cornerstone: Barrier Integrity

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” was identified after determining that the licensee had not adequately selected and reviewed the suitability of the design of the containment air cooler control circuitry. On March 26, 2008, Containment Air Cooler A fan shut down when shifted from fast to slow speed. Troubleshooting by the licensee determined that voltage was lost to the control power circuitry when the fast speed thermal overload tripped. Since the overload contacts were wired in series, Containment Air Cooler A experienced a complete loss of control power rendering it inoperable. The licensee determined the trip to be caused by operation of containment air coolers in fast speed, during a period of higher than normal containment pressure. The licensee analyzed the potential impact of the newly discovered adverse containment cooler design vulnerability against design basis accident scenarios. The licensee determined that a hot zero power main steam line break results in a delayed safety injection signal allowing the fan motor overloads to trip prior to being shed by the load sequencer. The containment air coolers would then experience a complete loss of control power and would not be capable of automatically restarting in slow speed. The analysis revealed that the peak containment pressure limit of 48.1 psig would be preserved. The licensee submitted a licensee event report as required by 10 CFR 50.73 since the inadequate containment air cooler control circuitry resulted in a condition prohibited by the plant’s Technical Specifications.

  This finding, failure to ensure the design of the containment air cooler control circuitry was suitable for all plant conditions, was more than minor because it was associated with the barrier integrity cornerstone attribute of design control and affects the associated cornerstone objective to provide reasonable assurance

that physical design barriers protect the public from radio nuclide releases caused by accidents or releases. Using Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," this finding was determined to be a Type B finding since it was related to a degraded condition that has potentially important implications for the integrity of the containment, without affecting the likelihood of core damage. This finding was found to be of very low safety significance because containment coolers are structures, systems or components that are not significant contributors to the large early release frequency. The inspectors determined that this finding does not have a crosscutting aspect associated with it since the performance deficiency was not indicative of current licensee performance (Section 1R15).

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," after Callaway control room operators improperly entered a wrong Technical Specification action statement due to the failure to maintain the Technical Specification Bases current. On June 17, 2008, during surveillance testing, Valve EMHV8823 failed to indicate fully closed. Since EMHV8823 is an isolation valve for containment Penetration 49, the licensee entered Technical Specification 3.6.3, "Containment Isolation Valves," Condition C, with an action to restore the valve to an operable status or isolate the penetration within 72 hours. Approximately 8 hours after Valve EMHV8823 had been declared inoperable, Callaway licensing personnel contacted the control room and informed them of an approved Technical Specification Bases change that did not allow Technical Specification 3.6.3, Condition C, to be applicable to containment Penetration 49. The Technical Specification Bases change was effective May 1, 2008, but had not been issued to the control room. The licensee determined that the more restrictive Technical Specification 3.6.3, Condition A, should have been entered with an action to isolate the affected penetration within 4 hours. The licensee performed a containment entry following discovery of entry into Technical Specification 3.6.3, Condition A, and found that Valve EMHV8823 failed its surveillance due to out of adjustment position indicator limit switches. The valve was verified closed and isolated allowing exit from Technical Specification 3.6.3, Condition A.

  This finding, failure to ensure the Technical Specification Bases were maintained current and available to the Callaway control room staff, was more than minor because if left uncorrected, the failure to maintain the Technical Specification Bases current could become a more significant safety concern. This finding was determined to affect the barrier integrity cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding is determined to be of very low safety significance since this finding did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in function of hydrogen ignitors in the reactor containment. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to communicate, in a timely manner, decisions to personnel who have a need to know the information in order to perform work safely [H.1(c)] (Section 1R22).

B. Licensee-Identified Violations

Two 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 corrective action tracking numbers are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status

AmerenUE operated the Callaway Plant at near 100 percent for the entire quarter.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Readiness of Offsite and Alternate AC Power System

a. Inspection Scope

The inspectors reviewed the licensee's plant features, training lesson plans, and procedures for operation and continued availability of offsite and alternate AC power systems to verify they were appropriate. The review included communication protocols and agreement procedures between the transmission system operator and the nuclear power plant to verify that appropriate information is exchanged when issues arise that could impact the offsite power system. Specifically, the procedures were verified to ensure they specified:

- Required actions needed when notified by the transmission system operator that posttrip voltage of the offsite power system would not be acceptable to assure the continued operation of safety related loads without transferring to the onsite power supply.
- Compensatory actions needed when it is not possible to predict the posttrip voltage at the nuclear power plant for current grid conditions.
- Required assessment of plant risk based on maintenance activities which could affect grid reliability, or the ability of the transmission system to provide the offsite power system.
- Required communications between the nuclear power plant and the transmission system operator when changes at the nuclear power plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite system power is challenged.

On May 16, 2008, the inspectors evaluated the licensee staff's preparations for summer readiness of offsite and AC power systems against the site's procedures and determined that the staff's actions were adequate. Documents reviewed are listed in the attachment.

These activities constituted one readiness of offsite power inspection sample as defined by Inspection Procedure 71111.01.

b. Findings

No findings of significance were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On May 2, 2008, the inspectors completed a review of the licensee's readiness for impending adverse weather involving severe thunderstorms. The inspectors: (1) reviewed plant procedures, the Final Safety Analysis Report (FSAR), and Technical Specifications to ensure that operator actions defined in adverse weather procedures maintained the readiness of essential systems; (2) walked down portions of the emergency diesel generators and offsite power systems to ensure that adverse weather protection features were sufficient to support operability; (3) reviewed maintenance records to determine that applicable surveillance requirements were current before the anticipated severe thunderstorms developed; and (4) reviewed plant modifications, procedure revisions, and operator work arounds to determine if recent facility changes challenged plant operation. Documents reviewed by the inspectors are listed in the attachment.

These activities constituted one readiness for impending adverse weather inspection sample as defined by Inspection Procedure 71111.01.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- June 3, 2008, Train A auxiliary feedwater system while the Train B motor-driven auxiliary feedwater pump was out of service for planned maintenance.
- June 10, 2008, Train A 480 volt NG Class 1E switchgear while the Train B emergency diesel generator was out of service for planned and emergent maintenance issues.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, FSAR, Technical Specification requirements, outstanding work orders, corrective action documents, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems

incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Documents reviewed are listed in the attachment.

These activities constituted two partial system walkdown samples as defined by Inspection Procedure 71111.04.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown (71111.04S)

a. Inspection Scope

On April 17, 2008, the inspectors performed a complete system alignment inspection of Train B of the residual heat removal system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved. The documents used for the walkdown and issue review are listed in the attachment.

These activities constituted one complete system walkdown sample as defined by Inspection Procedure 71111.04.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Inspector Tours (71111.05Q)

a. Inspection Scope

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

- March 27, 2008, Fire Area C-21, Lower Cable Spreading Room
- April 16, 2008, Fire Area A-17, Electrical Penetration Room (South)
- April 25, 2008, Condensate Storage Tank
- April 29, 2008, Fire Area A-23, Main Steam and Feedwater Isolation Valve Enclosure
- April 30, 2008, Reactor Building
- June 18, 2008, Fire Area A-1, North Pipe Chase

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

These activities constituted six quarterly fire protection inspection samples as defined by Inspection Procedure 71111.05.

b. Findings

No findings of significance were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On March 27, 2008, the inspectors observed a fire brigade activation due to a report of smoke in the laundry decontamination area. The observation evaluated the readiness of

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

These activities constituted one annual fire protection inspection sample as defined by Inspection Procedure 71111.05.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk-significant plant design features and licensee procedures intended to protect the plant and its safety related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the FSAR, engineering calculations, and abnormal operating procedures for licensee commitments. The inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water. The inspectors also reviewed the licensee's corrective actions for previously identified flood-related items. The inspectors performed a walkdown of the following plant area to assess the adequacy of any watertight doors and verify drains and sumps were clear of debris and operable, and that the licensee complied with its flooding related commitments:

- June 23, 2008, Control Building West Corridor

The document reviewed during this inspection is listed as follows:

- Callaway Action Request 200805189

This inspection constituted one internal flooding sample as defined in Inspection Procedure 71111.06.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On June 2, 2008, the inspectors observed a crew of licensed operators perform a Cycle 08-3 as found scenario in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The scenario involved an operating design basis earthquake with a lockout on essential 4 kV Bus NB01. The inspectors evaluated the crew in the following areas:

- Licensed operator performance
- Crew clarity and formality of communications
- Ability to take timely actions in the conservative direction
- Prioritization, interpretation, and verification of annunciator alarms
- Correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Ability to identify and implement appropriate Technical Specification actions and Emergency Plan actions and notifications

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the attachment.

This inspection constituted one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- May 15, 2008, Callaway Action Request (CAR) 200801644, an additional anode was found in the north end of the Train A emergency diesel generator intercooler
- May 15, 2008, CAR 200802854, KKJ01A (Train A emergency diesel generator) engine oil sump high

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

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule
- Characterizing system reliability issues for performance
- Charging unavailability time
- Trending key parameters for condition monitoring
- Ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or reclassification
- Verifying appropriate performance criteria for structures, systems, and components/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1)

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

This inspection constituted two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12Q.

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

- April 3, 2008, Routine - Work on turbine-driven auxiliary feedwater Valve KAPCV-0102
- April 21, 2008, Emergency Diesel Generator A lube oil trouble shooting
- April 28, 2008, Routine - associated with Loose Creek-Callaway 345 kV line outage

- June 10, 2008, Risk management actions associated with Emergency Diesel Generator B jacket water o-ring replacement outage

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

These activities constituted four samples as defined by Inspection Procedure 71111.13.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- March 26, 2008, CARs 200802348, 200802365, and 200802264, Containment coolers inoperable in fast speed
- April 4, 2008, CARs 200800461 and 200802625, Containment recirculation sump operability determination, Revisions 3 and 4
- April 9, 2008, Source Range Channel N32 inoperable due to a failed surveillance
- April 23, 2008, Component cooling water system following Valve EGHV0069 failing inservice test stroke time surveillance
- April 30, 2008, CAR 200803465, Emergency diesel generator Garlock flexible expansion joints
- May 6, 2008, CAR 200803462, Voiding identified in containment spray pump piping from sump
- May 22, 2008, CAR 200904000, Line EM-023 allowable void fraction exceeded

The inspectors selected potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that Technical Specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the Technical Specifications and FSAR to the licensee's

evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sample of corrective action documents to verify that the licensee was identifying and correcting deficiencies associated with operability evaluations. Documents reviewed are listed in the attachment.

This inspection constituted seven samples as defined in Inspection Procedure 71111.15.

b. Findings

.1 Introduction. A self-revealing Green noncited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified after determining that the licensee had not adequately selected and reviewed the suitability of the design of the containment air cooler control circuitry.

Description. On March 26, 2008, Containment Air Cooler A fan shut down when shifted from fast to slow speed. Troubleshooting by the licensee determined that voltage was lost to the control power circuitry when the fast speed thermal overload tripped. Since the overload contacts were wired in series, Containment Air Cooler A experienced a complete loss of control power rendering it inoperable. AmerenUE personnel noted that Precaution 3.6 of Procedure OTN-GN-00001, "Containment Cooling and CRDM Cooling," Revision 14, cautioned that high pressure and cool temperatures across containment coolers will cause the coolers to operate close to the setpoint of the thermal overloads. However, the licensee's operability determination dismissed the 1987 precaution as not having a technical basis believing it was implemented to address discrepancies in motor overload setpoints. Later, the licensee determined that operation of containment air coolers in fast speed, during a period of higher than normal containment pressure, challenged the fast speed thermal overload setpoint and resulted in the trip of Containment Air Cooler A on March 26, 2008. As an interim measure to prevent a trip from fast speed, the licensee imposed a standing order to maintain the containment coolers in slow speed.

The licensee analyzed the potential impact of the newly discovered adverse containment cooler design vulnerability against design basis accident scenarios. The licensee determined that a hot zero power main steam line break results in a delayed safety injection signal allowing the fan motor overloads to trip prior to being shed by the load sequencer. The containment air coolers would then experience a complete loss of control power and would not be capable of automatically restarting in slow speed. The analysis revealed that in this scenario, utilizing assumed accident conditions, the peak containment pressure would exceed the 48.1 psig limit described in the FSAR. However, analysis using actual plant conditions determined that the peak containment pressure limit of 48.1 psig would be preserved. The licensee submitted a licensee event report (LER) as required by 10 CFR 50.73 since the inadequate containment air cooler control circuitry resulted in a condition prohibited by the plant's Technical Specifications. The inspector's review of the licensee's LER is described in Section 4OA3 of this report.

To address the design deficiency associated with the containment air cooler control circuitry, the licensee completed a modification in April 2008 to reconfigure the circuit

such that tripping of the fast speed overloads would not impact the safety-related slow speed function of the containment air coolers.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to ensure the design of the containment air cooler control circuitry was suitable for all plant conditions. This finding was greater than minor because it was associated with the barrier integrity cornerstone attribute of design control and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radio nuclide releases caused by accidents or releases. Using Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," this finding was determined to be a Type B finding since it was related to a degraded condition that has potentially important implications for the integrity of the containment, without affecting the likelihood of core damage. This finding was found to be of very low safety significance since containment coolers are structures, systems, and components that have no impact on large early release frequency. The inspectors determined that this finding does not have a crosscutting aspect associated with it since the performance deficiency is not indicative of current licensee performance.

Enforcement. 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of structures, systems, and components. Contrary to the above, prior to April 2, 2008, the licensee failed to ensure that the containment air coolers would be able to perform their safety-related function in all accident scenarios due to a design deficiency associated with the overload contacts in the containment air cooler control circuitry. Because this finding is of very low safety significance and has been entered into the corrective action program as CAR 200702264, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy:
NCV 05000483/2008003-01, Failure to Ensure the Suitability of the Design of the Containment Air Cooler Control Circuitry.

.2 Introduction. The inspectors identified a Green NCV of Technical Specification 3.5.2, "Emergency Core Cooling Systems," after an inadequate surveillance procedure resulted in the licensee failing to maintain the emergency core cooling system (ECCS) full of water as required per Technical Specification 3.5.2.

Description. On May 21, 2008, Callaway Plant engineering discovered that a section of the cold leg recirculation piping, specifically the discharge of the residual heat removal pumps to the safety injection pumps, contained 6.6 cubic feet of air. This exceeded the allowable void fraction of 2.1 cubic feet required for operability. Callaway monthly surveillance Procedure OSP-SA-00003, "Emergency Core Cooling Flow Path Verification and Venting," had a purpose to: "Verify the ECCS is full of water," in accordance with Technical Specification Surveillance Requirement 3.5.2.3. This monthly surveillance was reviewed as part of significant condition adverse to quality (SCAQ) CAR 200501092 corrective actions. Callaway engineering had determined that residual heat removal pump discharge vent Valve EJV0193 to the safety injection system was the high point vent for these lines and was thus sufficient to vent Line EM-023-HCB – 6" to the safety injection pumps. However, this vent valve was not adequate due to the pipe sloping issues and normally closed Valves EMHIS8807A/B. Venting through Valve EMV0179 was necessary to completely fill, vent, and test the line. The monthly verification and vent procedure was inadequate to identify and remove air

introduced by relief valve maintenance on May 7, 2007, and thus ensure the ECCS was full of water. See Violation (VIO) 05000483/2008003-05 in Section 4OA2.

Analysis. Failure to adequately verify ECCS piping was full of water as required by Technical Specification 3.5.2 is a performance deficiency. This finding affected the mitigating system cornerstone procedure quality attribute. This finding is more than minor because it was similar to Example 3e of NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and met the "Not Minor If," criteria because the failure to meet the licensee's administrative requirement for allowable void fraction impacted the ability of the Train A safety injection system to function upon initiation of high-pressure recirculation. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the inspectors determined that this finding should be evaluated using the Phase 2 process described in Manual Chapter 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations."

As described in Section III of Appendix A, given that the presolved table did not contain a suitable target or surrogate for this finding, the senior reactor analyst used the risk-informed notebook to evaluate the significance of this finding. Table 2 provides the definitions for acronyms and initialisms used in the risk-informed notebook and discussed in this inspection report.

TABLE 2
Acronyms and Initialisms used in Phase 2 Notebook

Initialism	Initiating Event or Mitigating Function
TPCS	Transient with Loss of the Power Conversion System
SLOCA	Small-Break Loss of Coolant Accident
MLOCA	Medium-Break Loss of Coolant Accident
LLOCA	Large-Break Loss of Coolant Accident
LOOP	Loss of Offsite Power
MSLB	Main Steam Line Break
LBDC	Loss of Vital Direct-Current Bus
AFW	Auxiliary Feedwater
PCS	Power Conversion System (Steam and Feed)
HPR	High Pressure Recirculation
DEPR	Depressurization of the Reactor Coolant System
EAC	Emergency Power (Alternating Current)
TDAFW	Turbine-Driven Auxiliary Feedwater Pump Train
SEAL	Reactor Coolant Pump Seal Integrity
STIN	Operators Stop High-Pressure Injection
MDAFW	Motor-Driven Auxiliary Feedwater Pump Train

The analyst performed a Phase 2 estimation in accordance with Inspection Manual Chapter 0609, Appendix A, Attachment 2, "Site Specific Risk-Informed Inspection Notebook Usage Rules." Given that the performance deficiency was known to have existed for 378 days (May 7, 2007, until May 21, 2008) the analyst used 1 year as the exposure period. In accordance with Table 2 of the risk-informed notebook, the analyst evaluated all worksheets except LLOCA. All worksheets were evaluated using the nominal 1-year initiating event frequency. Because this finding only affected system functionality during recirculation, nominal mitigation credit was given for all functions with the exception of HPR. For HPR, the analyst made the bounding assumption that either

both centrifugal charging pumps or both safety injection pumps would be affected. This assumption was supported by licensee evaluation. The analyst solved each applicable worksheet and the dominant sequences are documented in Table 1.

TABLE 1
Phase 2 Dominant Sequences

Initiating Event	Sequence Number	Mitigating Functions	Results
Transients	1	AFW-PCS-HPR	9
TPCS	1	AFW-HPR	8
SLOCA	2	DEPR-HPR	8
MLOCA	2	DEPR-HPR	9
LOOP	1	AFW-HPR	9
	5	EAC-TDAFW-HPR	9
	9	EAC-SEAL-HPR	9
MSLB	8	STIN-HPR	8
LBDC	8	TDAFW-MDAFW-HPR	8

Using Inspection Manual Chapter 0609, Appendix A, Attachment 1, Table 5, “Counting Rule Worksheet,” the analyst determined that the risk contribution of this finding from internal initiating events was of very low risk significance. In accordance with Appendix A, Attachment 1, Steps 2.2.5 and 2.2.6, the analyst and determined that the risk contribution of this finding from external initiating events or the contribution from large-early release frequency were very low. Therefore, this finding was of very low risk significance (Green). This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and did not adopt a requirement to demonstrate that the single vent Valve EJV0193 was sufficient to vent the Line EM-023-HCB – 6" rather than assuming that installed Valve EMV0179 was not necessary to completely fill, vent, and test the line [H.1(b)].

Enforcement. Technical Specification 3.5.2 "Emergency Core Cooling Systems," Surveillance Requirement 3.5.2.3, required that the licensee verify that ECCS piping is full of water every 31 days. Contrary to the above, from June 2007 through April 2008, AmerenUE surveillance Procedure OSP-SA-00003, "Emergency Core Cooling Flow Path Verification and Venting," was inadequate to meet Technical Specification Surveillance Requirement 3.5.2.3. Because this finding is of very low safety significance and was entered into the licensee's corrective action program as CAR 200804000, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000483/2008003-02, Inadequate Surveillance Procedure Resulted in an Inoperable ECCS.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the design adequacy of the listed modifications. This included verifying that the modification preparation did not impair the following: (a) in-plant emergency/abnormal operating procedure actions, (b) key safety functions, and (c) operator response to loss of key safety functions.

The inspectors verified that postmodification testing maintained the plant in a safe configuration during testing and that the postmodification testing established operability by: (a) verifying that unintended system interactions did not occur; (b) verifying that performance characteristics, which could have been affected by the modification, met the design bases; (c) validating the appropriateness of modification design assumptions; and (d) demonstrating that the modification test acceptance criteria had been met.

- April 18, 2008, Modification M-08-0013 to separate fast and slow speed overload contacts for containment air coolers

- June 1, 2008, Temporary Modification TM 08-0003 for the instrument air system to provide an additional diesel-driven air compressor to improve system reliability while the system was in degraded reliability

Documents reviewed are listed in the attachment.

These activities constituted two samples as defined by Inspection Procedure 71111.18.

b. Findings

No findings of significance were identified

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

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

- April 10, 2008, Job 08002765.900, Source Range N32 postmaintenance test

- April 17, 2008, Postmaintenance test containment Cooler D, Modification 0800267/950(951)(952)

- May 7, 2008, Job 06524419.940, Emergency Diesel Generator B

- May 28, 2008, Job 08003910, Postmaintence test of Emergency Diesel Generator A following repair of jacket water leaks

- May 30, 2008, Job 08001080, Postmaintenance local leakrate test of containment personnel hatch door

These activities were selected based upon the structure, system, and component's ability to impact risk. The inspectors evaluated these activities to verify (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against Technical Specifications, the FSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the attachment.

This inspection constitutes five samples as defined in Inspection Procedure 71111.19.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified after the licensee failed to promptly correct leakage from diesel generator jacket water o-rings.

Description. On February 20, 2008, during performance of Procedure OSP-NE-0001B, “Standby Diesel Generator ‘B’ Periodic Tests,” Callaway operations personnel identified that the Emergency Diesel Generator B had an approximately 80 drop-per-minute jacket water leak. Analysis by the licensee determined the cause of the leakage to be from premature failure of Nitrile type o-rings in the jacket water supply and return headers. Operational history at Callaway revealed o-ring failures prior to reaching 3 years of service life. The o-rings responsible for the February 20, 2008, leakage had been in service since Refueling Outage 14 in October 2005. Following restoration of Emergency Diesel Generator B, the licensee re-evaluated the preventative maintenance frequency for jacket water o-ring replacement. Based on a review of prior o-ring failures, the replacement schedule for diesel generator jacket water o-rings was reduced from once every 3 years to once every refueling cycle.

On May 28, 2008, during performance of Procedure OSP-NE-0001A, “Standby Diesel Generator ‘A’ Periodic Tests,” Callaway operations personnel identified that Emergency Diesel Generator A had a 200 drop-per-minute jacket water leak. Based on the quantity of the leakage, operations personnel declared Emergency Diesel Generator A inoperable. Similar to the condition observed on Emergency Diesel Generator B on February 20, 2008, the source of the leakage was from Nitrile type o-rings within the jacket water system. While the licensee replaced the o-rings responsible for jacket water leakage following the February 20, 2008, surveillance, several Nitrile type o-rings installed during Refueling Outage 14 in October 2005 remained in service in both Emergency Diesel Generators Trains A and B including those that failed during the May 28, 2008, surveillance.

Subsequent analysis by the licensee determined that the required mission time of the Emergency Diesel Generator A was preserved since adequate inventory in the jacket water expansion tank existed such that the leakage observed on May 28, 2008, would not have impacted the net positive suction head analysis for the jacket water cooling pump.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to implement adequate corrective actions for an adverse condition. Specifically, the licensee failed to correct degraded Nitrile type o-rings in Emergency Diesel Generator A after previously identifying the adverse condition on Emergency Diesel Generator B. This finding was greater than minor because, if left uncorrected, degraded diesel generator jacket water o-rings could become a more significant safety concern. This finding affected the mitigating systems cornerstone. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined be of very low safety significance because it was a design deficiency confirmed not to result in loss of operability. This finding had a crosscutting aspect in the area of human performance associated with the work control component because the licensee failed to plan work activities to support long-term equipment reliability by addressing known degraded conditions in a more reactive than preventative manner [H.3(b)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to implement adequate corrective actions for the identified adverse condition that Nitrile type o-rings would prematurely fail prior to the completion of the regularly scheduled 3-year replacement interval. Because this violation is of very low safety significance and has been entered into the licensee's corrective action program as CAR 200804164, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000483/2008003-03, Failure to Correct a Condition Adverse to Quality for Diesel Generator Jacket Water O-Rings.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and Technical Specification requirements:

- April 2, 2008, Job 07513515.500, Routine surveillance auxiliary building Train A negative pressure test
- April 4, 2008, Job 08501501, Routine surveillance Slave Relay K645 test of essential service water component lineup
- April 18, 2008, Job 08501499, Routine surveillance Slave Relay K615 test
- April 29, 2008, Job 08501254.500, Residual heat removal Pump A inservice test

- May 5, 2008, Jobs 08502271 and 08503327, Routine surveillance containment base strong motion accelerometer seismic monitor calibration
- May 14, 2008, Job 07505653, Residual heat removal Train B valve inservice test
- June 11, 2008, Job 08504820, Routine surveillance diesel generator Train B 1-hour run
- June 17, 2008, Job 08503115, Safety injection system Train A valve inservice test
- June 18, 2008, Job 08505155, Routine surveillance ECCS flow path verification and venting
- June 23, 2008, Job 08506247, Reactor coolant system leakage surveillance, reactor coolant system inventory balance, plant status

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; the calibration frequency was in accordance with Technical Specifications, the FSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met Technical Specification requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; equipment was returned to a position or status required to support the performance of the safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program. Documents reviewed are listed in the attachment.

The inspectors completed six routine, three inservice test, and one reactor coolant system leakage samples.

b. Findings

Introduction. A self-revealing Green NCV of Technical Specification 5.4.1.a, "Procedures," was identified after Callaway control room operators improperly entered the wrong Technical Specification action statement due to the failure to maintain the Technical Specification Bases current.

Description. On June 17, 2008, during surveillance testing, Valve EMHV8823 failed to indicate fully closed. Since EMHV8823 is an isolation valve for containment Penetration 49, the licensee entered Technical Specification 3.6.3, “Containment Isolation Valves," Condition C, with an action to restore the valve to an operable status or isolate the penetration within 72 hours. The control room staff believed the appropriate action statement was entered since Condition C is described in the Technical Specification Bases as applicable to flow paths that meet the requirements of a closed system per the Callaway FSAR. Chapter 6.2.6.3 of the Callaway FSAR described Containment Penetration 49 as a closed engineered safety feature containment penetration.

Approximately 8 hours after Valve EMHV8823 had been declared inoperable, Callaway licensing personnel contacted the control room and informed them of an approved Technical Specification Bases change that did not allow the classification of containment Penetration 49 as a closed system. Procedure APA-ZZ-00108, “Primary Licensing Document; Change/Revision Process," required that the change be implemented within 45 days following approval. The Technical Specification Bases change was effective May 1, 2008, but had not been issued to the control room. The change resulted in Condition C of Technical Specification 3.6.3 applying specifically to penetrations for which a single containment isolation valve is credited per flow path. Since containment Penetration 49 relies on multiple valves for flow path isolation, the licensee determined that Condition C of Technical Specification 3.6.3 was not applicable for Penetration 49, and the wrong Technical Specification action statement had been entered following the failed surveillance on Valve EMHV8823. The licensee determined that the more restrictive Technical Specification 3.6.3, Condition A, should have been entered with an action to isolate the affected penetration within 4 hours.

The licensee performed a containment entry following discovery of entry into Technical Specification 3.6.3, Condition A, and found that Valve EMHV8823 had failed its surveillance due to out-of-adjustment position indicator limit switches. The valve was verified closed with power removed allowing exit from Technical Specification 3.6.3, Condition A.

Analysis. The performance deficiency associated with this finding involved the licensee’s failure to ensure the Technical Specification Bases were maintained current and available to the Callaway control room staff. This finding was greater than minor because, if left uncorrected, the failure to maintain the Technical Specification Bases current could become a more significant safety concern. This finding was determined to affect the barrier integrity cornerstone. Using Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings," this finding is determined to be of very low safety significance since this finding did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in function of hydrogen ignitors in the reactor containment. This finding had a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to communicate, in a timely manner, decisions to personnel who have a need to know the information in order to perform work safely [H.1(c)].

Enforcement. Technical Specification 5.4.1.a, “Procedures,” required that written procedures be established and implemented covering activities specified in Appendix A, “Typical Procedures for Pressurized Water Reactors,” of Regulatory Guide 1.33, “Quality

Assurance Program Requirements (Operation)," February 1978. Regulatory Guide 1.33, Appendix A, Section 1, required administrative procedures for procedure review and approval. Procedure APA-ZZ-00108 provides a process for implementing Technical Specification Bases change notices. Contrary to the above, on May 1, 2008, Procedure APA-ZZ-00108 was not adequate to ensure changes to the Technical Specification Bases were implemented in a timely manner. Because of the very low safety significance and AmerenUE's action to place this issue in their corrective action program as CAR 200805283, this violation is being treated as an NCV in accordance with Section VI.A.1 of the Enforcement Policy: NCV 05000483/2008003-04, Failure to Maintain an Adequate Technical Specification Bases Change Process.

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
- Physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools
- Self-assessments, audits, LERs, and special reports related to the access control program since the last inspection
- 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 accessible high dose rate - high radiation areas and very high radiation areas

Documents reviewed are listed in the attachment.

The inspectors completed 8 of the required 21 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:

- Current 3-year rolling average collective exposure
- Site-specific trends in collective exposures, plant historical data, and source-term measurements
- Site-specific ALARA procedures
- Work activities of highest exposure significance during the inspection
- Integration of ALARA requirements into work procedure and radiation work permit documents
- Post-job (work activity) reviews
- Workers' use of the low dose waiting areas
- First-line job supervisors' contribution to ensuring work activities are conducted in a dose efficient manner
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Source-term control strategy or justifications for not pursuing such exposure reduction initiatives
- Specific sources identified by the licensee for exposure reduction actions, priorities established for these actions, and results achieved since the last refueling cycle
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas

- Declared pregnant workers during the current assessment period, monitoring controls, and the exposure results
- Self-assessments, audits, and special reports related to the ALARA program since the last inspection
- Resolution through the corrective action process of problems identified through post-job reviews and post-outage ALARA report critiques
- Corrective action documents related to the ALARA program and follow-up activities, such as initial problem identification, characterization, and tracking
- Effectiveness of self-assessment activities with respect to identifying and addressing repetitive deficiencies or significant individual deficiencies

Documents reviewed are listed in the attachment.

The inspectors completed 9 of the required 15 samples and 8 of the optional samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the first Quarter 2008 performance indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

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

b. Findings

No findings of significance were identified.

.2 Safety System Functional Failures

Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period March 2007 until March 2008. To determine the accuracy of the performance indicator data reported during this period, performance indicator definitions and guidance contained in the Nuclear Energy Institute (NEI)

Document 99-02, Revision 5, “Regulatory Assessment Performance Indicator Guideline,” and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73," definitions and guidance were used. The inspectors reviewed the licensee’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC integrated inspection reports for the period of 2nd Quarter 2007, through 1st Quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the attachment.

This inspection constitutes one safety system functional failures sample as defined by Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - High Pressure Injection Systems

Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - high pressure injection systems performance indicator for the period from March 2007 until March 2008. To determine the accuracy of the performance indicator data reported during this period, performance indicator definitions and guidance contained in the NEI Document 99-02, 5, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of 2nd Quarter 2007 through 1st Quarter 2008 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the attachment.

This inspection constitutes one mitigating systems performance index high pressure injection systems sample as defined by Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.4 Occupational Exposure Control Effectiveness

Cornerstone: Occupational Radiation Safety

a. Inspection Scope

The inspectors reviewed licensee documents from October 1, 2007, through March 31, 2008. 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 NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 5). Additional records reviewed included ALARA 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 NEI 99-02, Revision 5, were used to verify the basis in reporting for each data element.

The inspectors completed the required sample (1) in this cornerstone.

b. Findings

No findings of significance were identified.

.5 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

Cornerstone: Public Radiation Safety

a. Inspection Scope

The inspectors reviewed licensee documents from October 1, 2007, through March 31, 2008. 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 NEI 99-02, Revision 5, were used to verify the basis in reporting for each data element.

The inspectors completed the required sample (1) in this cornerstone.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

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

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

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

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

These daily reviews were performed, by procedure, as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

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.

- Voiding discovered in the common residual heat removal discharge piping for high pressure recirculation.
- FSAR changes/updates

Documents reviewed are listed in the attachment.

This inspection constituted two in-depth problem identification and resolution samples.

b. Findings

Introduction. The inspectors identified a Green violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," because the licensee failed to take corrective actions to preclude repetition of void formations in the ECCS, a significant condition adverse to quality (SCAQ). Contributors to the violation included: (1) the failure of corrective actions from inspection report findings NCV 05000483/2005002-01, 05000483/2006012-04 and CAR 200501092 to ensure adequate fill and vent of systems following maintenance to replace safety injection system relief valves, and (2) inadequate extent of condition reviews in responding to internal and external operating experience associated with pipe sloping issues in the safety injection system.

Description. On May 21, 2008, the Callaway Plant staff initiated CAR 200804000, a SCAQ corrective action document, indicating that some piping in Train A safety injection system suction lines had incorrect sloping and were susceptible to voiding due to high points. Callaway Plant engineering performed ultrasonic inspection of the safety injection system common suction piping Line EM023-HCB – 6" and discovered a 6.6 cubic foot voided area. This exceeded the allowable void fraction of 2.1 cubic feet required for operability. This voided piping, determined to have existed for over a year, was caused by relief valve maintenance on Valve EM8858A (May 7, 2007). The maintenance restoration failed to perform an adequate fill and vent to ensure the suction pipe was full of water.

In 2005 and 2006 the NRC issued NCVs regarding ineffective corrective actions related to safety injection system voids in discharge piping (05000483/2005002-01 dated May 6, 2005, and 05000483/2006012-04 dated December 26, 2006). These were each 10 CFR Part 50, Appendix B, Criterion XVI, NCVs, each for SCAQ. The Callaway Plant staff issued CAR 200501092 as a SCAQ corrective action document. The CAR determined that the causes of the voids (2004, 2005, and 2006) were related to incorrect pipe sloping (allowing high points where voids could not be swept away by normal online pump surveillances) and inadequate postmaintenance fill and vent operations (following discharge piping relief Valve EM8853A replacement) to ensure the piping was full of water.

Inadequate Operating Experience and Extent of Condition Corrections: The inspectors identified several related examples where the licensee had performed either inadequate operating experience evaluations, inadequate extent of condition reviews, or inadequate procedure corrections.

Callaway CAR 200501092 referenced industry operating experience at Beaver Valley Unit 2 in 2002: "The void was located in the piping used following a loss of coolant

accident after the transfer to containment sump recirculation. The piping containing the void led to a common suction header for both trains of high head pumps." This was the same location as the voiding discovered at Callaway Plant on May 21, 2008.

NRC Information Notice 2006-21, "Operating Experience Regarding Entrainment of Air into Emergency Core Cooling and Containment Spray Systems," dated September 21, 2006, discussed mechanisms that could result in air entrainment on the suction sides of emergency core cooling pumps. The notice emphasized the importance of ensuring that entrained air will not enter suction supply lines and impair the ability of the ECCS and containment spray pumps to perform their safety function.

The licensee's evaluation of NRC Information Notice 2006-21 was documented in CAR 200608956. It stated that the information notice was applicable to Callaway and that past review of these operating experiences and Callaway procedures and practices were adequate. The CAR was closed December 5, 2006.

Callaway CAR 200501092 had Action 7 assigned to address the previous NRC violations discussed above. The action required that system specific fill and vent restoration guidance be developed to address maintenance on ECCS safety-related systems. Initially, operating department Standing Order 05-002 dated June 8, 2005, stated that the CAR 200501092 common cause analysis supported the need for formalized restoration instructions. Until the system specific restoration instructions were developed, the standing order required reactor operators to perform reviews to ensure dynamic filling and venting occurred to reduce the susceptibility of voiding. Also nuclear engineering department staff were to provide concurrence on such restoration plans. Night Order ODP-ZZ-00310, "System Fill and Vent," issued February 13, 2006, reiterated that reactor operator reviews and engineering concurrence were required when these risk-significant systems were drained. However, on May 7, 2007, Procedure OTN-EM-00001, "Safety Injection System," (developed to address filling and venting evaluations) had Line EM-023-HCB – 6" isolated by Valve EMHIS8807B being closed. The procedure did not include use of the available installed vent Valve EM179 for this line.

Callaway monthly Surveillance OSP-SA-00003, "Emergency Core Cooling Flow Path Verification and Venting," had a purpose to: "Verify the ECCS is full of water in accordance with Technical Specification Surveillance Requirement 3.5.2.3." This monthly surveillance was reviewed as part of CAR 200501092 corrective actions. Callaway engineering had determined that residual heat removal pump discharge vent Valve EJV0193 to the safety injection suction line was the high point vent for these lines and was thus sufficient to vent supply Line EM-023-HCB – 6" to the safety injection pumps. However, this vent valve was not adequate due to the pipe sloping issues and normally closed Valves EMHIS8807A/B. The monthly verification and vent procedure was inadequate to remove the air entrained by the May 7, 2007, relief valve maintenance. See Section 1R15, NCV 05000483/2008003-02.

Callaway CARs 200800226 and 200800246, initiated in January 2008, discussed operating experience at Wolf Creek Nuclear Operating Corporation describing gas voiding in the residual heat removal piggyback Line EM-022-HCB – 6" to the suction of centrifugal charging pumps and safety injection pumps. The CARs stated that Callaway had taken a proactive approach and had immediately performed ultrasonic testing to demonstrate that the associated piping was water solid. However, the adjacent

connecting Line EM-023-HCB – 6" had not been vented nor had ultrasonic testing occurred since the May 7, 2007, relief Valve EM8858A maintenance.

NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," was issued January 11, 2008. The Callaway Plant staff initiated CAR 200800298 to respond to the generic letter. The generic letter identified that a licensing basis concern existed for some plants, such as Callaway, that Technical Specifications require verifying that ECCS discharge piping is full of water but may not include verification of the suction piping despite the realistic concern that gas accumulation in suction piping may be more serious than gas accumulation in discharge piping. The void found in Line EM-023-HCB – 6" was the discharge of the residual heat removal pumps providing suction to the Train A safety injection pump. The Callaway monthly Surveillance OSP-SA-00003, "Emergency Core Cooling Flow Path Verification and Venting," did not test for or vent the discharge line from residual heat removal to safety injection pump suction piping.

Analysis. The inspectors determined that the failure to restore compliance within a reasonable time by establishing measures to prevent void formation in ECCS suction piping for the Train A safety injection system was a performance deficiency. This finding is more than minor because it was similar to Example 3e of NRC Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," and met the “Not Minor If,” criteria because the failure to meet the licensee’s administrative requirement for allowable void fraction impacted the ability of the Train A safety injection system to function upon initiation of high-pressure recirculation. Using Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” the inspectors determined that this finding should be evaluated using the Phase 2 process described in Manual Chapter 0609, Appendix A, “Determining the Significance of Reactor Inspection Findings for At-Power Situations.”

The senior reactor analyst determined that the risk of this finding was bounded by that analyzed for NCV 05000423/2008003-02 (See Section 1R15.b.2). Therefore, this finding was of very low risk significance (Green).

This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action component because AmerenUE failed to thoroughly evaluate voiding problems such that the resolutions addressed causes and extent of condition, as necessary. This also includes, for significant problems, conducting effectiveness reviews of corrective actions to ensure that the problems are resolved [P.1(c)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires the licensee to, in the case of SCAQ, establish measures to assure that the cause of the condition is determined and corrective action is taken to preclude repetition. Contrary to the above, from December 26, 2006, to May 21, 2008, the licensee did not implement corrective action to preclude repetition of void formation in the safety injection piping which the licensee categorized as an SCAQ. Specifically, void formation recurred after performing maintenance on relief valve. Valve EM8858A, on May 7, 2007. Previously discovered voiding of the safety injection system was last documented as an SCAQ in NCV 05000483/2006012-04 dated December 26, 2006. For each instance of the previously discovered voids, the causes were determined to be related to inadequate fill and vent of the system piping following relief valve replacements and design deficiencies

associated with inadequate sloping of the piping. It was a reasonable assumption that maintenance that drained either the suction or discharge piping could create significant void areas.

Although this violation is of very low safety significance, the violation is being cited in a Notice of Violation consistent with Section VI.A.1 of the NRC Enforcement Policy because the licensee did not restore compliance within a reasonable time after a previous violation NCV 05000483/2006012-04 was identified: VIO 05000483/2008003-05, Failure to Prevent Recurrence of Voids in ECCS Cold Leg Recirculation Piping. This finding has been entered into the licensee's corrective action program as a SCAQ in CAR 200804000.

.4 Semiannual Trend Review

The inspectors assessed trends that might indicate the existence of a more significant safety issue. These issues included trends that might not rise to the level of an inspection finding.

NRC-Identified Trends

The NRC identified emergency diesel generator material condition and design control issues degrading diesel reliability:

- CAR 200801270: 80 Drops per minute jacket water leak identified on Diesel Generator B
- CAR 200801644: Additional sacrificial anode found in Emergency Diesel Generator A intercooler heat exchanger
- CAR 200802019: Emergency Diesel Generator B declared inoperable due to fuel oil leaks
- CAR 200802177: Cracked fuel oil return line fitting identified on Emergency Diesel Generator A
- CAR 200804164: Emergency Diesel Generator A declared inoperable due to a 200 drops per minute jacket water leak

Licensee-Identified Trends

The licensee identified a continued trend in plant status control and configuration control with a key causal factor being procedure adherence.

- CAR 200706832: This trend CAR from Third Quarter 2007 identified the cause of plant status control issues to be a "Failure to follow written instructions."
- CAR 200801457: A gauge was installed on an incorrect component during Test Procedure OSP-EN-P001A.
- CAR 200800580: A trend of critical steps not being included in work packages was identified.

- CAR 200802603: Component cooling water pump autostarted due to an interlock with the centrifugal charging pumps. The operator failed to wait the procedure prerequisite 30 minutes prior to securing the component cooling water pump.

- CAR 200802818: Source range Channel N31 was not restored to "block" as required by procedure in Mode 1.

- CAR 200800328: Not following procedures resulted in gaseous Radiation Monitor RM-11 trip setpoint not being capable of isolating the waste gas decay tank release.

- CAR 200803351: Steam generator blowdown tripped due to an incorrect demineralizer valve lineup.

- CAR 200804483: Train B motor-driven auxiliary feedwater pump made inoperable when its room cooler was taken to "stop" vice "auto." This was performed outside the out of service restoration process.

This inspection constituted one semiannual trend review sample.

4OA3 Event Follow-up (71153)

(Closed) LER 05000483/2008-001-00, Containment Cooler Inoperability

On March 26, 2008, Containment Air Cooler A fan shut down when shifted from fast to slow speed. The licensee determined that operation of containment air coolers in fast speed, during a period of higher than normal containment pressure, would challenge the fast speed thermal overload setpoint. Additionally, since the overload contacts are wired in series, containment air coolers were determined to experience a complete loss of control power following a trip from fast speed. The licensee analyzed the potential impact of the containment cooler design vulnerability against design basis accident scenarios. The licensee determined that a hot zero power main steam line break results in a delayed safety injection signal allowing the fan motor overloads to trip prior to being shed from the load sequencer. In this scenario, utilizing actual plant conditions, the peak containment pressure would not exceed the 48.1 psig limit described in the FSAR. To address the design deficiency associated with the containment air cooler control circuitry, the licensee completed a modification in April 2008 to reconfigure the circuit such that tripping of the fast speed overloads would not impact the safety-related slow speed function of the containment air coolers. This finding is of very low safety significance because the containment coolers are structures, systems, and components that are not significant contributors to the large early release frequency. Licensee corrective actions were recorded in CAR 200802264. The inspectors reviewed the LER and identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the licensee’s failure to adequately review the suitability of the design of the containment air cooler control circuitry (Section 1R15). This LER is closed.

This inspection constituted one sample of follow-up of events.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. During the inspection period, the inspectors performed the following observations of security force personnel and activities to ensure that the activities were consistent with licensee's security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observation of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 (Closed) NRC Temporary Instruction 2515/166: Pressurized Water Reactor Containment Sump Blockage

a. Inspection Scope

From March 17-19, 2008, 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 reviewed various aspects of the on-going procedural changes. Those changes that have been completed were verified to be properly documented in accordance with the requirements of 10 CFR 50.59. At the completion of this inspection, the licensee had completed the installation stage of the new sump strainers; many of the procedural 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."

Status of the implementation of the plant modifications and procedure changes committed to by the licensee in their Generic Letter 2004-02 response is:

1. Containment walkdown to provide current assessment of Callaway's containment coatings and latent debris.

The licensee completed a containment walkdown and latent debris assessment during Refueling Outage 14. The resident inspectors completed a walkdown of the containment prior to reactor startup following the outage. The licensee report, "Containment Building Latent Debris Assessment Refuel 14 Fall 2005," was reviewed by the inspectors.

2. The following corrective action activities will be completed:

   a. Replacement sump strainer structural analysis.

      The strainers were not built in accordance with the design. As a result, calculations needed to be revised due to the deviations of the as built condition from design and errors in temperature correction values used in the initial calculations. Completion date: June 30, 2008

   b. Downstream effects evaluation

      Completion date: June 30, 2008

   c. Upstream effects evaluation

      Completion date: June 30, 2008

   d. Resolution of debris generation calculation unverified assumption of 5D ZOI for qualified coatings (via coatings testing)

      Completion date: June 30, 2008

   e. Replacement sump screen head loss testing

      Completion date: June 30, 2008

3. Provide an update of the information contained in Section 2(c) regarding analysis methodology.

   Completion date: June 30, 2008

4. The following evaluations and testing will be completed.

   a. Industry chemical effects testing

      Completion date: June 30, 2008

   b. Nuclear Energy Institute 04-07 debris generation calculation

      Completion date: June 30, 2008

   c. Evaluation of chemical effects impact on sump-strainer head loss

      Completion date: June 30, 2008

   d. Confirmation that the replacement sump strainer design provides for available Net Positive Suction Head (NPSH) to be in excess of required NPSH

      Completion date: June 30, 2008

e. Completion of the final site acceptance review of the Westinghouse team analysis summary report

Completion date: June 30, 2008

5. Callaway Plant will complete the following items during Refueling Outage15:

a. Replacement of containment recirculation sump strainers

Completed. As noted in the previous Temporary Instruction 166 report, the resident inspectors had observed the installation of sump strainers and debris barriers during their containment walkdown; however, the strainers were not built in accordance with the design. The licensee has completed their initial determination of operability and was finalizing their acceptance calculations.

b. Modification of containment debris barriers and interceptors as required

Completed. As noted in the previous Temporary Instruction 166 report, the resident inspectors had observed the installation of sump strainers and debris barriers during their containment walkdown.

c. Evaluation and implementation of potential modification to the safety injection system to address downstream effects

Completion date: June 30, 2008

6. Callaway Plant will complete removal of containment spray system pump cyclone separators, if required, based on the results of the downstream effects evaluation.

Completion date: June 30, 2008

7. The following programs and controls will be implemented at Callaway Plant to control debris sources:

a. Changes to design change process procedures to ensure that necessary engineering evaluations will be performed for plant design that either directly or indirectly affects containment, ECCS, or CSS.

Changes are being processed.

b. Changes to containment entry and material control procedure requirements for control of materials during work activities conducted in the containment

c. The following procedures were reviewed and completed as of December 2007:

APA-ZZ-01004, Radiological Work Standards, Revision 9

HDP-ZZ-06100, Reactor Building Access, Revision 7

MDP-ZZ-S0001, Scaffolding Installation and Evaluation, Revision 22

OSP-EJ-00003, Containment Recirculation Sump Inspection, Revision 6

OSP-SA-00004, Visual Inspection of Containment for Loose Debris, Revision 19

OTS-ZZ-06032, Addendum 1, Debris and Particulate Control Devices, Revision 2

d. Changes to programs and procedures that have the potential to add tags and labels inside containment

Completed: December 2007

The following documents were reviewed:

APA-ZZ-01004, Radiological Work Standards, Revision 9

HDP-ZZ-06100, Reactor Building Access, Revision 7

MDP-ZZ-S0001, Scaffolding Installation and Evaluation, Revision 22

OSP-EJ-00003, Containment Recirculation Sump Inspection, Revision 6

OSP-SA-00004, Visual Inspection of Containment for Loose Debris, Revision 19

OTS-ZZ-06032, Addendum 1, Debris and Particulate Control Devices, Revision 2

e. Implementation of a containment coatings assessment program

Licensee reported as complete. The inspectors reviewed SWE07848, "Containment Coating Condition Assessment." A preventative maintenance item has been scheduled to perform containment coating assessments with a periodicity of each refueling cycle.

f. Implementation of a containment latent debris assessment program

Licensee reported as complete. The inspectors reviewed report, "Containment Building Latent Debris Assessment Refuel 14 Fall 2005," and Procedure OSP-SA-00004, "Visual Inspection of Containment for Loose Debris," Revision 019. A preventative maintenance item has been scheduled for a visual inspection of containment for loose debris with a periodicity of each refueling cycle.

g. Implementation of changes to the inspection processes for the installed sump strainers

Licensee reported as complete. Reviewed Procedure OSP-EJ-00003, Containment Recirculation Sump Inspection, Revision 6

8. A final response will be submitted to the NRC to provide a final status of actions requested by Generic Letter 2004-02.

   Completion date: June 30, 2008

The Office of Nuclear Reactor Regulation will determine the adequacy of the sump modifications with respect to Generic Safety Issue 191. This temporary instruction is closed.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

On April 25, 2008, the health physics inspector presented the occupational radiation safety inspection results to Mr. T. Herrmann and other members of his staff who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On June 18, 2008, the Temporary Instruction 2515/166 inspector presented the inspection results to Mr. S. Maglio and other members of his staff who acknowledged the findings. The inspector confirmed that proprietary information provided or examined during the inspection had been returned.

On June 24, 2008, the resident inspectors presented the inspection results to Mr. C. Naslund, Senior Vice President and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors understood and acknowledged that proprietary information reviewed would not be retained following report issuance.

4OA7 Licensee-Identified Violations

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

- 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, on March 5, 2008, the licensee identified that a 4-foot section of suction piping within containment spray system, Train A was approximately 50 percent voided. Voiding within the containment spray system was due to a design deficiency that did not allow for a proper fill and vent of the system. This was entered in the licensee’s corrective action program as CAR 200803462. This finding is greater than minor because it is similar to the Example 3j in Manual Chapter 0612, Appendix E, "Examples of

Minor Issues," in that the presence of air within the containment spray system suction header resulted in a condition where there was reasonable doubt on the operability of the system. This finding is of very low safety significance because it was a design or qualification deficiency confirmed not to result in loss of operability.

- 10 CFR Part 50, Appendix B, Criterion III, requires measures be established to assure that applicable regulatory requirements and design basis be correctly translated into specifications, drawings, procedures, and instructions. Technical Specifications 3.5.2 and 3.6.6 require that residual heat removal and containment spray system components remain operable. Contrary to this, measures were not adequate to assure installed center tube diameters for the containment recirculation sump modification were correctly accounted for by an accurate net positive suction head calculation.

  The vendor supplying AmerenUE the containment recirculation sump strainer identified that associated Vendor Calculation TDI-6002-05 for clean strainer head loss did not account for the installed orifices located in the strainer support plate. The size of the orifice beneath each strainer was smaller than assumed in head loss calculations and was not large enough to prevent head loss in excess of the net positive suction head required as defined in the purchase specification supplied to the strainer vendor. The additional head loss due to the calculation translation error was 2.28 feet. This resulted in required net positive suction head being less than available. AmerenUE performed three separate operability determination reviews to demonstrate that the head loss margin could be recovered. The initial operability determination on January 22, 2008, addressed the smaller support plate orifice holes by using a separate vendor's flow analysis of the residual heat removal and containment spray piping systems to demonstrate lower flow and head losses than described in the FSAR. This operability determination resulted in the limiting case flow path being the hot leg recirculation flow path. Another operability review on March 12, 2008, addressed a nonconservative temperature correction through the orifices. Subsequent to this, the licensee informed the NRC that the additional nonconservative inputs were used in the January 22, 2008, flow re-analysis of the residual heat removal system. Additional analyses were performed to regain margin. This resulted in the limiting case flow path changing from hot leg recirculation to cold leg recirculation.

  This example of inadequate design control was captured in the licensee's corrective action program as CARs 200800461 and 200802618. These corrective action reviews documented three causes related to the following design error:

  - Time pressure to address Generic Letter 2004-02
  - A complex design with parallel sequencing of different parts of the design
  - AmerenUE not independently verifying the vendor's design due to perceived expertise and an approved 10 CFR Part 50, Appendix B,

Quality Assurance program. AmerenUE did not perform a review of the design, nor did they contract to have a third party engineering review of the design.

This finding is greater than minor because it is similar to the Example 3j in Manual Chapter 0612, Appendix E, Examples of Minor Issues, in that the contractor error translating the design to the calculations resulted in a condition where there was reasonable doubt on the operability of the ECCS. This finding is of very low safety significance because it was a design or qualification deficiency confirmed not to result in loss of operability. This licensee-identified violation closes out Unresolved Item 05000483/2008002-01.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Barton, Training Manager
M. Brandes, Consulting Engineer, Nuclear Engineering - Major Modifications
K. Bruckerhoff, Supervisor, Emergency Preparedness
F. Diya, Plant Director
T. Elwood, Supervising Engineer, Licensing
R. Farnam, Manager, Radiation Protection
K. Gilliam, Supervisor, Radiation Protection
L. Graessle, Manager, Regulatory Affairs
A. Heflin, Vice President, Nuclear
T. Herrmann, Vice President, Engineering
B. Holderness, Senior Health Physicist, Environmental Services
L. Kanuckel, Manager, Quality Assurance
D. Lantz, Superintendent of Operations Training
S. Maglio, Assistant Manager, Regulatory Affairs
R. Myatt, Supervisor, Engineering
K. Mills, Manager, Engineering
D. Neterer, Manager, Nuclear Operations
T. Parker, Trainer, Radiation Protection
S. Petzel, Engineer, Regulatory Affairs
J. Pitts, Component Engineer
V. Rider, ALARA Specialist, Radiation Protection

LIST OF ITEMS OPENED AND CLOSED

Opened

05000483/2008003-05	VIO	Failure to Prevent Recurrence of Voids in ECCS Cold Leg Recirculation Piping (Section 4OA2)

Opened and Closed

05000483/2008003-01	NCV	Failure to Ensure the Suitability of the Design of the Containment Air Cooler Control Circuitry (Section 1R15)
05000483/2008003-02	NCV	Inadequate Surveillance Procedure Resulted in an Inoperable ECCS (Section 1R15)
05000483/2008003-03	NCV	Failure to Correct a Condition Adverse to Quality for Diesel Generator Jacket Water O-Rings (Section 1R19)
05000483/2008003-04	NCV	Failure to Maintain an Adequate Technical Specification Bases Change Process (Section 1R22)

Closed

05000483/2008001-00	LER	Containment Cooler Inoperability (Section 4OA3)
05000483/2008002-01	URI	Containment Recirculation Sump Operability (Section 4OA7)

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Section 1R01: Adverse Weather Protection

Procedures

ODP-ZZ-00001, Operations Department – Code of Conduct, Revision 41

OSP-NB-00001, Class 1E Electrical Source Verification, Revision 032

OTN-NB-0001A, 4.16 KV Vital (Class 1E) Electrical System – A Train, Revision 12

OTN-NB-0001A, Addendum 5, NB01 Loss of Power Recovery, Revision 0

OTO-ZZ-00012, Severe Weather, Revision 10

Miscellaneous

AmerenUE Response to Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power

Training Lesson Plan LP-01, Systems, Switchyard MD

Training Lesson Plan T61.0110.6, Systems, Switchyard MD

Section 1RO4: Equipment Alignment

Drawings

M-22AL01A, Piping and Instrumentation Diagram Auxiliary Feedwater System, Revision 33

M-22BB01(Q), Piping and Instrumentation Diagram Reactor Coolant System, Revision 30

M-22BB03A(Q), Piping and Instrumentation Diagram Reactor Coolant System, Revision 9

M-22BB03B(Q), Piping and Instrumentation Diagram Reactor Coolant System, Revision 9

M-22BB03C(Q), Piping and Instrumentation Diagram Reactor Coolant System, Revision 7

M-22BB03D(Q), Piping and Instrumentation Diagram Reactor Coolant System, Revision 7

M-22BG01(Q), Piping and Instrumentation Diagram Chemical and Volume Control System, Revision 28

M-22BG03(Q), Piping and Instrumentation Diagram Chemical and Volume Control System, Revision 52

M-22EJ01(Q), Piping and Instrumentation Diagram Residual Heat Removal System, Revision 57

M-22EM01(Q), Piping and Instrumentation Diagram High Pressure Coolant Injection System, Revision 33

M-22EM02(Q), Piping and Instrumentation Diagram High Pressure Coolant Injection System, Revision 19

M-22EP01(Q), Piping and Instrumentation Diagram Accumulator and Safety Injection, Revision 16

Section 1RO5: Fire Protection

Miscellaneous

Drill Number 08-01, Evaluate Fire Brigade Response in a Radiation Area, dated March 27, 2008

Drill Critique Number 08-01, Unannounced Fire Drill, dated March 27, 2008

FSAR, Appendix 9.5B, Fire Hazard Analysis

Section 1R11: Licensed Operator Requalification Program

Procedures

OTA-RK-00024, Addendum 98D, Seismic Event, Revision 0
OTO-SG-0001, Design Basis Earthquake, Revision 13

Section 1R12: Maintenance Effectiveness

Procedures

EDP-ZZ-01128, Maintenance Rule Program, Revision 8

NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Revision 3

Callaway Action Requests

200706892	200801644	200802854

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

Procedure

EDP-ZZ-01129, Callaway Plant Risk Assessment, Revision 14

Section 1R15: Operability Evaluations

Calculations

ARC-687, AFT Fathom 6.0 Output, Revision 0

M-FL-18, LOCA and MSLB Containment Flood Level, Revision 1

WES-009-CALC-001, Wolf Creek/Callaway Post-LOCA Containment Water Level Calculation, Revision 0

Callaway Action Requests

200800461	200802352	200803462
200802231	200802365	200804000
200802264	200802618	
200802348	200803252	

Drawings

E-018-00141, Sz. 5 2SP-1WD Schematic, Revision 19

E-018-00214, Wiring Diagram 2SP-1WD (Size 5), Revision 19

E-018-00273, Motor Control Center Ambient Compensated Overload Relay Heater Chart, Revision 3

E-018-00847, Overload Relay Time Current Characteristics, Revision 4

E-018-00852, Sz. 5 2SP-1WD Schematic, Revision 11

E-018-00853, Wiring Diagram 2SP 1WD (Size 5), Revision 12

E-22NF01, Load Shedding and Emergency Load Sequencing Logic, Revision 5

E-23GN02, Schematic Diagram Containment Cooler Fans A and C, Revision 12

E-23GN02A, Schematic Diagram Containment Cooler Fans B and D, Revision 13

J-22GN02A, Containment Cooling System Containment Cooling Fans SGN01A and SGN01C, Revision 2

J-22GN02C, Containment Cooling System Containment Cooling Fans SGN01B and SGN01D, Revision 1

M-018-00943, 206 Ez-Flo Expansion Joint, Revision 0

M-22BG03, Piping and Instrumentation Diagram Chemical and Volume Control System, Revision 52

M-22EM01, Piping and Instrumentation Diagram High Pressure Coolant Injection System, Revision 33

M-23BG02, Piping Isometric CVCS-Max Charging Flow A and B Train Auxiliary Building, Revision 12

Procedures

ECA-0.1, Loss of All AC Power Recover Without Safety Injection Required, Revision 8

ECA-1.1, Loss of Emergency Coolant Recirculation, Revision 8

EDP-ZZ-04021, Review of Supplier Documents, Revision 5

ISF-SE-00N32, FCTNAL-NUC INSTM SOURCE RANGE N32, Revision 20

OSP-EJ-PV04A, Train A RHR and RCS Check Valve Inservice Test –IPTE, Revision 0

OSP-EJ-PV04B, Train B RHR and RCS Check Valve Inservice Test –IPTE, Revision 1

OTN-EN-00001, Containment Spray System, Revision 14

OTN-GN-00001, Containment Cooling and CRDM Cooling, Revision 1

Miscellaneous

Job 07513275 for SEN0032

Letter ULNRC-04884, Docket Number 50-483, Callaway Plant Unit 1, Union Electric Co., Facility Operating License NPF-30, Response to NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactor, dated August 3, 2003

Letter ULNRC-05481, Docket Number 50-483, Callaway Plant Unit 1, Union Electric Co., Facility Operating License NPF-30 Response to Request for Additional Information, Response to NRC Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors, dated February 29, 2008

Garlock Sealing Technologies Customer Requested Test 206 Ez-Flo Expansion Test, dated November 15, 2006

Section 1R18: Plant Modifications

Procedure

OTN-KA-00001, Compressed Air System, Revision 18

Drawings

E-018-00141, Sz. 5 2SP-1WD Schematic, Revision 19

E-018-00214, Wiring Diagram 2SP-1WD (Size 5), Revision 19

E-018-00852, Sz. 5 2SP-1WD Schematic, Revision 11

E-018-00853, Wiring Diagram 2SP 1WD (Size 5), Revision 12

E-22NF01, Load Shedding and Emergency Load Sequencing Logic, Revision 5

E-23GN02, Schematic Diagram Containment Cooler Fans A and C, Revision 12

E-23GN02A, Schematic Diagram Containment Cooler Fans B and D, Revision 13

J-22GN02A, Containment Cooling System Containment Cooling Fans SGN01A and SGN01C, Revision 2

J-22GN02C, Containment Cooling System Containment Cooling Fans SGN01B and SGN01D, Revision 1

M-22KA01, Piping and Instrumentation Diagram Compressed Air System, Revision 016A

M-22KA06, Piping and Instrumentation Diagram Instrument Air Filter/Dryer Turbine, Building, Revision 30A

Miscellaneous

Modification Package 08-0013, Containment Coolers DSGN01A/B/C/D Control Circuit Change, Revision 0

Job

08003842

Section 1R19: Postmaintenance Testing

Procedures

APA-ZZ-00330, Preventative Maintenance Program, Revision 29

OTN-GN-00001, Containment Cooling and CRDM Cooling, Revision 14

Callaway Action Requests

200801270	200802810	200804164

Jobs

06524419	08001080	08002765
07006905	08002676	08003910

Drawings

E-018-00141, Sz. 5 2SP-1WD Schematic, Revision 19

E-018-00214, Wiring Diagram 2SP-1WD (Size 5), Revision 19

E-018-00853, Wiring Diagram 2SP 1WD (Size 5), Revision 12

E-018-00852, Sz. 5 2SP-1WD Schematic, Revision 11

E-22NF01, Load Shedding and Emergency Load Sequencing Logic, Revision 5

E-23GN02, Schematic Diagram Containment Cooler Fans A and C, Revision 12

E-23GN02A, Schematic Diagram Containment Cooler Fans B and D, Revision 13

J-22GN02A, Containment Cooling System Containment Cooling Fans SGN01A and SGN01C, Revision 2

J-22GN02C, Containment Cooling System Containment Cooling Fans SGN01B and SGN01D, Revision 1

Miscellaneous

Modification Package 08-0013, Containment Coolers DSGN01A/B/C/D Control Circuit Change, Revision 0

Simple Surveillance SP08-017, Containment Cooler Control Circuit Changes, dated April 16, 2008

Section 1R22: Surveillance Testing

Procedures

EDP-ZZ-04107, HVAC Pressure Boundary Control, Revision 19

FDP-ZZ-00101, Technical Specification Bases Control Program, Revision 6

OSP-GL-0001A, Auxiliary Building Train A Negative Pressure Test, Revision 6

OSP-EJ-P001A, RHR Train A inservice Test – Group A, Revision 44

OSP-EJ-V001B, Residual heat removal Train B valve inservice test, Revision 21

OSP-NE-0001B, Standby Diesel Generator B Periodic Tests, Revision 29

OSP-SA-00003, Emergency Core Cooling System Flow Path Verification and Venting, Revision 30

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

Callaway Action Requests

200703726	200800631	200800991
200703956	200800632	200801135
200710799	200800633	200801390
200711181	200800727	200801430
200711846	200800838	200802003
200711875	200800887	200802280
200711880	200800888	200803141
200711881	200800891	200803204
200711883	200800957	200803205
200800219	200800973	200803208
200800438	200800988	

Audits and Self-Assessments

Quality Assurance Audit of Radiation Protection AP08-001, February 28, 2008
Quality Assurance Supplemental Audit of Radwaste AP07-012, October 30, 2007
Simple Self-assessment Report SA07-RP-S06, January 9, 2008

Radiation Work Permits/ALARA Reviews

RWP 803321RESIN, Transfer Spent Resin from Primary Tank to Liner
ALARA Package 07-03120, Reinstall Bladders into the Recycle Hold Up Tanks

Other/Meetings/Training/Work Review

ALARA Simulator Class
Callaway Plant Long Range Dose and Source Term Reduction Plan, Revision 2
Hot Spot and Shielding Log
Job 08000834 Transfer Spent Resin from Primary Tank to Liner
Plant ALARA Review Committee Meeting

Procedures

APA-ZZ-00405, Special Nuclear Material Control and Accounting, Revision 20

APA-ZZ-01000, Callaway Plant Radiation Protection Program, Revision 26

APA-ZZ-01001, Callaway Plant ALARA Program, Revision 11

APA-ZZ-01106, Lock and Key Control, Revision 16

HDP-ZZ-01100, ALARA Planning and Review, Revision 6

HDP-ZZ-01200, Radiation Work Permits, Revision 9

HTP-ZZ-01203, Radiological Area Access Control, Revision 36

HTP-ZZ-06001, High Radiation/Very High Radiation Area Access, Revision 31

HTP-ZZ-06028, Radiological Controls for Pools that Contain or Store Spent Fuel, Revision 5

RTS-HC-00350, Primary Spent Resin Storage Tank Transfer to Bulk Waste Disposal Station, Revision 3

Section 4OA1: Performance Indicator Verification

Procedure

NOD-QP-40, NRC Performance Indicator Program, Revision 2

Miscellaneous

Various Callaway Control Room Logs, dated March 2007 through March 2008
Callaway Integrated Inspection Report 05000483/2007002

Callaway Integrated Inspection Report 05000483/2007003
Callaway Integrated Inspection Report 05000483/2007004
Callaway Integrated Inspection Report 05000483/2008002

Section 4OA2: Identification and Resolution of Problems

Inspection Findings

NCV 05000483/2005002-01
NCV 05000483/2006012-04

Callaway Action Requests

200501192	200800355	200804000
200709819	200800522	200804164
200711496	200801270	200805049
200800246	200801529	200805122
200800298	200801830	200808956

Generic Communications

NRC Information Notice 2006-21, OE Regarding Entrainment of Air into Emergency Core Cooling and Containment Spray Systems, September 21, 2006

Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal , and Containment Spray Systems, January 11, 2009

Procedures

OTN-EM0001, Safety Injection System, Revision 27

OSP-SA-00003, Emergency Core Cooling System Flow Path Verification and Venting, Revision 27

Section 4OA5: Other

Procedures

APA-ZZ-01004, Radiological Work Standards, Revision 9
HDP-ZZ-06100, Reactor Building Access, Revision 7
MDP-ZZ-S0001, Scaffolding Installation and Evaluation, Revision 22
OSP-EJ-00003, Containment Recirculation Sump Inspection, Revision 6
OSP-SA-00004, Visual Inspection of Containment for Loose Debris, Revision 19
OTS-ZZ-06032, Addendum 1, Debris and Particulate Control Devices, Revision 2

Calculations

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

Calculation BN-21, Impact of MP 06-0003, Replacement Containment Recirculation Sump Strainer on BN21, Revision 0

Calculation BN-22, Impact of MP 06-0003, Replacement Containment Recirculation Sump Strainer on BN22, Revision 0

Calculation EJ-29, NPSH Margin for RHR Pumps at Transition to Recirculation When NPSH Margin is at its Minimum Value, Revision 1

Calculation TDI-6002-05/TDI-6003-05, Clean Head Loss – Wolf Creek/Callaway, Revision 0

Callaway Action Request

200800461, Prompt Operability Determination for Containment Spray and Residual Heat Removal Systems, Revision 0

Miscellaneous

Ameren/UE comments on ECI-PCI-WC-CAL-6002-6003-1001

Callaway Plant Containment Building Latent Debris Assessment Report Refuel 14 Fall 2005

EC-PCI-WC/CAL-6002/6003-1001, AES Calculation No. PCI-5304-S01 Structural Evaluation of the Containment Sump Strainers, Revision 1

MP 06-0003-EC-PCI-WC-CAL-6002-6003- (000) AES Document No. PCI-5304-S01 Structural Evaluation of the Containment Sump Strainers, Revision 1

NUREG/CR-6914, Vol. 4, Integrated Chemical Effects Test, Revision 0

SWE07848, Containment Coating Condition Assessment

TDI-6002/TDI-6003, Sure-Flow Suction Strainer Qualification Report and Addendums, Wolf Creek/Callaway

ULNRC-05124, 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-05194, Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 September 1, 2005, Response To Generic Letter 2004-02, Potential Impact of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors.

ULNRC-05295, Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Response Update To Generic Letter 2004-02, Potential Impact of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors.

ULNRC-05408, Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Update For Response To Generic Letter 2004-02, Potential Impact of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors.

ULNRC-05461, Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Request for Extension Of Completion Date For Corrective Actions Associated with NRC Generic Letter 2004-02, Potential Impact of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors.

ULNRC-05465, Docket Number 50-483 Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Supplement to Request for Extension of Corrective Actions Completion Date For NRC Generic Letter 2004-02, Potential Impact of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors.

WCAP-16568-P, Jet Impingement Testing to Determine the Zone of Influence (ZOI) for BAQualified/Acceptable Coatings (Proprietary)

Wolf Creek/Callaway Comments on Calculation PCI-5304-S01, Structural Evaluation of the Containment Sump Strainers.

Section 4OA7: Licensee-Identified Violations

Callaway Action Requests

200802618 200803462 200800461

Generic Communication

Generic Letter 2004-02, “Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors,” dated September 13, 2004

Calculation

TDI-6002-05

Correspondence

Amendment 180 to Facility Operating License NPF-30 from Mr. J. Donohew, Senior Project Manager, Office of Nuclear Reactor Regulation to Mr. C. Naslund, AmerenUE

Procedure

APA-ZZ-00408, Professional Service Agreements and Nuclear Fuel Contracts, Revision 12
AmerenUE Callaway Plant Nuclear Plant Operating Quality Assurance Manual, Section 3, Revision 25

Audits

Quality Assurance Audit of Design Control AP08-003

Independent Technical Review Report, SEGR 08-012, Temperature Correction Factor for Strainer Stack Orifice Head Losses