



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

February 6, 2007

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

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION
REPORT 05000483/2006005

Dear Mr. Naslund:

On December 31, 2006, the NRC completed an inspection at your Callaway Plant. The enclosed report documents the inspection findings which were discussed on January 9, 2007, with Mr. Adam Heflin, Vice President, and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has identified five Green findings. Four issues were evaluated under the risk significance determination process as having very low safety significance (Green) and one Severity Level VI issue was also evaluated. The NRC has determined that violations are associated with all of these issues. These violations are being treated as noncited violations (NCVs), consistent with Section VI.A of the Enforcement Policy. The NCVs are described in the subject inspection report. If you contest these violations or the significance of 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, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Callaway Plant facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Vincent G. Gaddy, Chief
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Docket: 50-483
License: NPF-30

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05000483/2006005
w/attachment: Supplemental Information

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SUNSI Review Completed: yes ADAMS: Yes No Initials: vgg
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RI:DRP/B	SRI:DRP/B	SRA:DRS	C:DRS/EB2	C:DRS/EB1
DEDumbacher	MSPeck	MFRunyan	LJSmith	WBJones
VGGaddy for	VGGaddy for	VGGaddy for	JMateychick for	/RA/
2/3/07	2/3/07	1/18/07	1/25/07	1/30/07
C:DRS/OB	C:DRS/PSB	C:DRP/B		
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 50-483
License: NPF-30
Report Number: 05000483/2006005
Licensee: Union Electric Company
Facility: Callaway Plant
Location: Junction Highway CC and Highway O
Fulton, Missouri
Dates: September 24 through December 31, 2006
Inspectors: M. S. Peck, Senior Resident Inspector
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Approved By: V. G. Gaddy, Chief, Project Branch B

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SUMMARY OF FINDINGS

IR 05000483/2006005; 09/24/2006 - 12/31/2006; Callaway Plant: Fire Protection, Maintenance Effectiveness, Maintenance Risk Assessments and Emergent Work Control, Permanent Plant Modifications, and Identification and Resolution of Problems.

This report covered a 3-month inspection by region based emergency preparedness and health physics inspectors, a region based senior reactor analyst, and resident inspectors. Five Green findings, all of which were noncited violations, were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be Green or assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG 1649, "Reactor Oversight Process," Revision 3, dated July 2000.

Inspector-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. On November 21, 2006, the inspectors identified a noncited violation of Technical Specification 5.4.1.d, "Fire Protection Program," after AmerenUE failed to identify and correct a degraded auxiliary building fire door. The inspectors identified that the latching mechanism on Fire Door 15031 would not engage because the double door had not been pinned. Failure of the door to latch resulted in a reduction in fire confinement capability. The door was required to provide a 3-hour fire barrier. The licensee had several prior opportunities to identify the degraded fire door. Security and operations personnel passed through the door several times each shift. The inspectors previously identified that the latch on Fire Door 15031 was degraded. Following the previous finding, AmerenUE implemented actions to increase the sensitivity of plant personnel to degraded fire doors. These actions were not effective to ensure that licensee personnel would recognize and enter the degraded fire door into the Corrective Action Program.

This finding is greater than minor because the degraded fire barrier affected the mitigating systems cornerstone external factors attribute objective to prevent undesirable consequences due to fire. Using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors determined this finding is in the fire confinement category and that the barrier was moderately degraded because the door latch was not functional. This finding is of very low safety significance because the exposed fire area contained no potential damage targets that are unique from those in the exposing fire area. The inspectors concluded that this finding has a problem identification and resolution crosscutting aspect associated with the corrective action program component because the licensee did not implement the corrective action program with a low threshold to identify the degraded door. The licensee entered this issue into the Corrective Action Program as Callaway Action Request CAR 200609621 (Section 1R05).

- Green. The inspectors identified a noncited violation of 10 CFR 50.65(a)(2) after AmerenUE failed to categorize the failure of motor-operated valve auxiliary contacts as a maintenance preventable functional failure and to monitor the component as required by 10 CFR 50.65(a)(1). On May 22, 2006, safety injection system motor-operated Valve EMHV8814A failed to open during surveillance testing due to stuck auxiliary contacts. On June 29, 2006, the Callaway maintenance rule expert panel concluded that the failure was not a maintenance preventable functional failure. The inspectors reviewed the maintenance history of station motor-operated valves and determined 18 previous auxiliary contact failures had occurred since 2002. Also, AmerenUE had initiated a modification to compensate for motor-operated valve electrical cubicle obsolescence and corrective action to address auxiliary contact failures. The inspectors determined that the June 29, 2006, expert panel incorrectly concluded that the auxiliary contact failures were not maintenance preventable. AmerenUE failed to perform an evaluation as required by 10 CFR 50.65(a)(1). On November 16, 2006, the expert panel reevaluated the failure of Valve EMHV8814A and five other auxiliary contact failures and concluded the failures were maintenance preventable functional failures and placed the auxiliary contacts system in 10 CFR 50.65(a)(1).

This finding is greater than minor because the failure of the expert panel to perform adequate evaluations would become a more significant safety concern if left uncorrected. This issue is similar to Example 7.b provided in Manual Chapter 0612, Appendix E. The inspectors analyzed this finding using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet. The inspectors determined this finding is of very low safety significance because, this finding is not a design or qualification deficiency, did not result in loss of safety function of a single train for greater than the allowed Technical Specification outage time, and was not related to a seismic, flooding, or severe weather event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the expert panel did not thoroughly or adequately evaluate the failure of the valve to address the causes and extent of condition. The licensee entered this issue into the Corrective Action Program as Callaway Action Request 200609603 (Section 1R12).

- Green. On September 26, 2006, the inspectors identified a noncited violation of 10 CFR 50.65(a)(4) after AmerenUE failed to adequately manage the risk associated with maintenance on the turbine-driven auxiliary feedwater pump. AmerenUE removed the turbine-driven auxiliary feedwater pump from service for planned maintenance. The licensee determined this activity increased plant risk into the next higher risk configuration (Yellow). Procedure APA-ZZ-00315, "Configuration Risk Management Program," required AmerenUE to take actions to protect redundant/diverse safety systems and components. Procedure APA-ZZ-00315 also stated that, if work could result in a risk-significant configuration or loss of system functions, consider use of physical barriers, such as ropes and/or signs to protect redundant/diverse components. AmerenUE did not take adequate protective actions or use physical barriers on the redundant Train B motor-driven auxiliary feedwater pump. Plant workers passing through the motor-driven auxiliary feedwater pump room inadvertently rendered the pump inoperable by disabling the room cooler. The licensee determined that disabling the room cooler increased plant risk into the next higher risk configuration (Orange).

This finding is greater than minor because the licensee failed to implement prescribed significant compensatory measures during planned maintenance activity. This finding is similar to Example 7.g. provided in Manual Chapter 0612, Appendix E, because the auxiliary feedwater system key safety function was degraded. The inspectors used Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," Flowchart 2, "Assessment of Risk Management Actions," to analyze this finding. The inspectors calculated an incremental core damage probability of 6.8×10^{-8} for the event, based a one-hour risk exposure duration and an increase of core damage probability from 1.8×10^{-4} to 7.1×10^{-4} after the Train B motor-driven auxiliary feedwater pump inadvertently rendered the pump inoperable. The inspectors determined the finding is of very low safety significance because incremental core damage probability 6.8×10^{-8} was less than 1.0×10^{-6} . This finding has a crosscutting aspect in the area of human performance associated with the work control component because the licensee failed to appropriately plan work activities by incorporating risk insights and compensatory actions. The licensee entered this issue into the Corrective Action Program as Callaway Action Request 20070284 (Section 1R13).

- Green. On October 6, 2006, the inspectors identified a noncited (Severity Level IV) violation of 10 CFR 50.59 after AmerenUE failed to obtain prior NRC approval before removing the steam generator blowdown valve Limiting Condition for Operations requirement from the facility Technical Specifications. Section 50.36 of Title 10 of the Code of Federal Regulations, "Technical Specifications," required AmerenUE to establish a limiting condition for operations for components that are required to mitigate a design basis accident. The Callaway Plant accident analysis required the steam generator blowdown valves to close to mitigate the steam line break accident and to ensure the auxiliary feedwater system safety function. AmerenUE met this requirement by including the blowdown valves in Technical Specification 3.6.3, "Containment Isolation Valves," as referenced in Final Safety Analysis Report Table 16.6-1, "Containment Isolation Valves." On May 10, 2006, AmerenUE implemented Final Safety Analysis Report Change Notice 02-012, which removed the blowdown valves from Table 16.6-1. This change removed the blowdown valves from within the scope of the Technical Specifications limiting condition for operations. The Section 50.59 safety evaluation supporting Change Notice 02-012 failed to identify that removal of the blowdown valves involved a change to the plant Technical Specifications and required prior NRC approval.

This issue involved traditional enforcement because AmerenUE did not receive prior NRC approval before changing the facility Technical Specifications. The inspectors evaluated this issue using Manual Chapter 0612, Appendix B. This issue is more than minor because the mitigating systems cornerstone attribute of equipment performance, reliability, and capability is impacted based on removal of the blowdown valve out-of-service time limits from the Technical Specifications. The inspectors used Manual Chapter 0609, "Significance Determination Process," Phase 1, to analyze the safety significance of the violation. The inspectors concluded that the violation is of very low safety significance because the issue was not a design or qualification deficiency confirmed to result in loss of operability, did not represent a loss of system safety function or an actual loss of safety function of one or more non-Technical Specification

risk-significant equipment trains, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The issue has a problem identification and resolution crosscutting aspect associated with the corrective action program because the licensee's safety evaluation did not thoroughly evaluate the change such that the resolutions address causes and extent of conditions, as necessary. The licensee entered this issue into the Corrective Action Program as Callaway Action Request 200608902 (Section 1R17).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," after the licensee failed to adequately evaluate and promptly correct an operator workaround that resulted in the loss of nitrogen pressure on a safety injection accumulator. On December 3, 2006, Accumulator D was rendered inoperable due to low pressure. The low pressure condition occurred as plant operators attempted to add nitrogen to the accumulator. Plant operator efforts to work around degraded containment isolation and pressure relief valves during the filling operation resulted in an inoperable accumulator. The accumulator pressure had dropped below the minimum allowed Technical Specification pressure of 602 psig.

This issue is greater than minor because this finding is associated with the reactor safety mitigating systems cornerstone attribute of equipment performance and affects the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the inspectors determined that this finding is of very low significance because, although the condition did involve the loss of operability, it did not result in a loss of system safety train or function and did not involve a seismic, flooding or severe weather event. This finding, which involved an inadequate evaluation of an operator workaround, has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because AmerenUE did not thoroughly evaluate problems such that resolutions addressed the causes and extent of conditions, as necessary. The licensee entered this issue into the Corrective Action Program as Callaway Action Request 200700286 (Section 4OA2).

REPORT DETAILS

Summary of Plant Status

AmerenUE operated the Callaway Plant at full power for the entire inspection period.

1. REACTOR SAFETY
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

Readiness for Seasonal Susceptibilities

The inspectors completed a review of the licensee's readiness of seasonal susceptibilities involving cold outdoor ambient temperature. 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) evaluated operator staffing levels to ensure the licensee could maintain the readiness of essential systems required by plant procedures; and (3) reviewed the corrective action program to determine if the licensee identified and corrected problems related to adverse weather conditions. On November 2 and 3, 2006, the inspectors verified the implementation of Procedure OTS-ZZ-00007, "Plant Cold Weather," by plant walkdown of the cold weather preparations performed on the refueling and primary water storage tanks.

Documents reviewed by the inspectors included:

- Night Order, Cold Weather Operations, November 3, 2006
- Procedure OTS-ZZ-00007, Plant Cold Weather, Revision 12

The inspectors completed one system specific weather related condition sample.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors: (1) walked down portions of risk important systems and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned; and (2) compared deficiencies identified during the walkdown to

AmerenUE's FSAR and corrective action program to ensure problems were being identified and corrected.

- October 17, 2006, Train B ultimate heat sink
- October 19, 2006, Train B emergency diesel generator
- November 30 and December 4, 2006, Train A 125 Volt vital batteries

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown (71111.04S)

a. Inspection Scope

The inspectors: (1) reviewed plant procedures, drawings, the FSAR, Technical Specifications, and vendor manuals to determine the correct alignment of the containment spray system; (2) reviewed outstanding design issues, operator workarounds, and FSAR documents to determine if open issues affected the functionality of the containment spray system; and (3) verified that the licensee was identifying and resolving equipment alignment problems. Documents reviewed by the inspectors are listed in the attachment.

- October 6, 2006, Containment spray system

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope

The inspectors walked down the listed plant areas to assess the material condition of active and passive fire protection features and their operational lineup and readiness. The inspectors: (1) verified that transient combustibles and hot work activities were controlled in accordance with plant procedures; (2) observed the condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional and that access to manual actuators was unobstructed; (4) verified that fire extinguishers and hose stations were provided at their

designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers, steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified that adequate compensatory measures were established for degraded or inoperable fire protection features and that the compensatory measures were commensurate with the significance of the deficiency; and (7) reviewed the FSAR to determine if AmerenUE identified and corrected fire protection problems.

- September 27, 2006, Area A-29, East feedwater valve room
- September 27, 2006, Area A-30, West feedwater valve room
- October 6, 2006, Area A-7, Boron injection room
- October 6, 2006, Area A-20, Component cooling water surge tank area
- October 27, 2006, Area C-21, Lower cable spreading room
- October 27, 2006, Area C-22, Upper cable chase room, 2073 level
- November 21, 2006, Area A-21, Control room air conditioning
- November 21, 2006, Area F-7, Emergency exhaust
- November 21, 2006, Area F-4, Air handling equipment
- November 21, 2006, Area A-19, Auxiliary building, 2047 level

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed 10 samples.

b. Findings

Failure to Identify a Degraded Fire Barrier

Introduction: The inspectors identified a Green noncited violation (NCV) of Technical Specification 5.4.1.d, "Fire Protection Program," after AmerenUE failed to identify and correct a degraded auxiliary building fire door.

Description: The inspectors identified that auxiliary building Fire Door 15031 was degraded on November 21, 2006. The latching mechanism would not engage because the double door had not been pinned. The failure of the door to latch resulted in a reduction in fire confinement capability. The door was required to provide a 3-hour fire barrier between Fire Areas A-19 and A-20. The licensee had several opportunities to identify the degraded fire door. Security and operations personnel passed through the door several times each shift. The inspectors previously identified that the latch on Fire Door 15031 was degraded on November 1, 2004 (NCV 05000483/2004005-01). Following the previous finding, AmerenUE implemented actions to increase the sensitivity of plant personnel to degraded fire doors. These actions were not effective to ensure that licensee personnel would recognize and enter the degraded fire door into the Corrective Action Program.

Analysis: The failure of AmerenUE to ensure the integrity of Fire Door 15031 is a performance deficiency. This finding is greater than minor because the degraded fire barrier affected the mitigating systems cornerstone external factors attribute objective to prevent undesirable consequences due to fire. The inspectors used Manual

Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," to analyze this finding. The inspectors determined this finding was a fire confinement category and that the fire barrier was moderately degraded because the door latch was not functional. The inspectors concluded that this finding is of very low safety significance because the exposed fire area contained no potential damage targets that are unique from those in the exposing fire area. The inspectors concluded that this finding has a problem identification and resolution crosscutting aspect associated with the corrective action program component because the licensee did not implement the corrective action program with a low threshold to identify the degraded door.

Enforcement: Technical Specification 5.4.1.d required that AmerenUE maintain a fire protection program. Administrative Procedure APA-ZZ-00700, "Fire Protection Program," Administrative Procedure APA-ZZ-00701, "Control of Impairments of Fire Protection Systems and Components," and FSAR Section 9.5.B, "Fire Hazards Analysis," implemented the Callaway Fire Protection Program. Procedure APA-ZZ-00701 required plant personnel to maintain the integrity of plant fire doors. Contrary to the above, on November 21, 2006, plant personnel failed to maintain the integrity of Fire Door 15031. Because this finding is of very low safety significance and was entered into the corrective action program (Callaway Action Request (CAR) 200609621), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000483/2006005-01, Failure to Identify a Degraded Fire Barrier).

1R06 Flood Protection Measures (71111.06)

.1 Annual External Flooding

a. Inspection Scope

The inspectors: (1) reviewed the FSAR, the flooding analysis, and plant procedures to assess seasonal susceptibilities involving external flooding; (2) reviewed the FSAR and corrective action program to determine if the licensee identified and corrected flooding problems; (3) inspected underground bunkers/manholes to verify the adequacy of: (a) sump pumps, (b) level alarm circuits, (c) cable splices subject to submergence, and (d) drainage for bunkers/manholes; (4) verified that operator actions for coping with flooding can reasonably achieve the desired outcomes; and (5) walked down the ultimate heat sink retention pond and the essential service water pump house to verify the adequacy of: (a) equipment seals located below the floodline, (b) floor and wall penetration seals, (c) watertight door seals, (d) common drain lines and sumps, (e) sump pumps, level alarms, and control circuits, and (f) temporary or removable flood barriers.

- October 21, 2006, Ultimate heat sink retention pond and the essential service water pump house

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Semiannual Internal Flooding

a. Inspection Scope

The inspectors: (1) reviewed the FSAR, the flooding analysis, and plant procedures to assess seasonal susceptibilities involving internal flooding; (2) reviewed the FSAR and corrective action program to determine if the licensee identified and corrected flooding problems; (3) inspected underground bunkers/manholes to verify the adequacy of: (a) sump pumps, (b) level alarm circuits, (c) cable splices subject to submergence, and (d) drainage for bunkers/manholes; (4) verified that operator actions for coping with flooding can reasonably achieve the desired outcomes; and (5) walked down the feedwater pump pipe chase to verify the adequacy of: (a) equipment seals located below the floodline, (b) floor and wall penetration seals, (c) watertight door seals, (d) common drain lines and sumps, (e) sump pumps, level alarms, and control circuits, and (f) temporary or removable flood barriers.

- November 1 and 2, 2006, Auxiliary feedwater pump pipe chase, Rooms 1206 and 1207

Documents reviewed by the inspectors included:

- Calculation M-FL-04, Addendum 2, Recalculation of Design Bases Flood Depth in Rooms 1206 and 1207 Due to Non-conservative Error in Original Bechtel Calculation
- Calculation M-FL-01, Revision 2, Flooding of the Auxiliary Building

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors observed testing and training of senior reactor operators and reactor operators to identify deficiencies and discrepancies in the training, to assess operator performance, and to assess the evaluator's critique. On September 29, 2006, the inspectors observed simulator training sessions involving a turbine trip below P-9 reactor trip permissive.

Documents reviewed by the inspectors included:

- Procedure OTO-AC-00001, Turbine Trip Below P-9, Revision 9

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Biennial Inspection

a. Inspection Scope

Following the completion of the annual operating examination testing cycle, which ended the week of June 30, 2006, the inspector reviewed the overall pass/fail results of the annual individual job performance measure operating tests and simulator operating tests administered by the licensee during the operator licensing requalification cycle. Ten separate crews participated in simulator operating tests, and job performance measure operating tests, totaling 56 licensed operators. All of the crews tested passed the simulator portion of the annual operating test. All of the licensed operators passed the job performance measure portion of the examination.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q)

a. Inspection Scope

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

- CAR 200604013, Failure of safety injection Valve EMHV8814A
- CAR 200607949, Failure of Train B motor-driven auxiliary feedwater pump
- CAR 200509372, Failure of the cold overpressure mitigation system

Documents reviewed by the inspectors included:

- Procedure EDP-ZZ-001128, Maintenance Rule Program, Revision 7
- Expert Panel Meeting, NET #06-0044, June 29, 2006

Enclosure

- Expert Panel Meeting, NET #06-0074, November 16, 2006
- CAR 200609726, Failure to Properly Categorize a Maintenance Preventable Functional Failure

The inspectors completed three samples.

b. Findings

Failure to Properly Categorize a Maintenance Preventable Functional Failure

Introduction: The inspectors identified a Green NCV of 10 CFR 50.65(a)(2) after AmerenUE failed to categorize the failure of motor-operated valve auxiliary contacts as a maintenance preventable functional failure and to monitor the component as required by 10 CFR 50.65(a)(1).

Description: On May 22, 2006, safety injection system motor-operated Valve EMHV8814A failed to open during surveillance testing. AmerenUE determined the valve failed because auxiliary contacts had stuck closed. The auxiliary contacts, located in the breaker cubicle, provide an electrical interlock that prevented both motor starters from being energized simultaneously. On June 29, 2006, the Callaway maintenance rule expert panel concluded the failure was not a result of lack of maintenance activity and that no operational experience would have prevented the failure.

The inspectors reviewed the motor-operated valves' maintenance history and determined that 18 previous auxiliary contact failures occurred since 2002. In 2001, AmerenUE initiated Modification MP 01-1003A, "Replacement of the Gould ITE 5600 Series Cubicles," to compensate for cubicle obsolescence and to address auxiliary contact failures. Procedure EDP-ZZ-01128, "Maintenance Rule Program," Attachment 3, described repetitive maintenance preventable functional failure events as events that: (1) occurred on the same type of components; (2) had the same basic cause; and (3) had reasonable opportunity for corrective actions from previous maintenance preventable functional failures to have been implemented. The inspectors determined that the June 29, 2006, expert panel incorrectly concluded that the auxiliary contact failures were not maintenance preventable. As a result, AmerenUE failed to perform a system performance evaluation as required by 10 CFR 50.65(a)(1). On November 16, 2006, the expert panel reevaluated the failure of Valve EMHV8814 and five other auxiliary contact failures, concluded that the failures were maintenance preventable functional failures, and commenced monitoring the auxiliary contact system as required by 10 CFR 50.65(a)(1).

Analysis: Failure of the maintenance rule expert panel to perform an adequate evaluation of the failure of Valve EMHV8814 is a performance deficiency. This finding is greater than minor because failure of the expert panel to perform adequate evaluations would become a more significant safety concern if left uncorrected. This issue is similar to Example 7.b provided in Manual Chapter 0612, Appendix E. The inspectors used the

Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet to analyze this finding. Because this finding involved the safety injection system, the inspectors concluded that this finding affected the mitigating systems cornerstone. The inspectors determined this finding is of very low safety significance because this finding is not a design or qualification deficiency, did not result in loss of safety function of a single train for greater than the allowed Technical Specification outage time, and was not related to a seismic, flooding, or severe weather event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the expert panel did not thoroughly or adequately evaluate the failure of the valve to address the causes and extent of condition.

Enforcement: Part 50.65(a)(2) of Title 10 of the Code of Federal Regulations required monitoring of structures, systems, or components through the performance of appropriate preventive maintenance, such that the structures, systems, or components remain capable of performing their intended function. Contrary to the above, AmerenUE did not adequately monitor the auxiliary contact system through the performance of appropriate preventive maintenance, such that the component remained capable of performing its intended function. On June 29, 2006, Callaway's expert panel incorrectly concluded that the failure of safety injection Valve EMHV8814A was not a maintenance preventable functional failure and monitoring as required by 10 CFR 50.65(a)(1) was not performed. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program (CAR 200609603), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000483/2006005-02, Failure to Properly Categorize a Maintenance Preventable Functional Failure).

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

a. Inspection Scope

The inspectors reviewed the following activities to verify that the appropriate risk assessments were performed prior to removing equipment for work. 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 verified the appropriate use of the licensee's risk assessment tool and risk categories in accordance with Procedure EDP-ZZ-01129, "Callaway Plant Risk Assessment," and Procedure EDP-ZZ-01128, "Maintenance Rule Program."

- September 27, 2006, planned turbine-driven auxiliary feedwater pump outage
- October 17, 2006, planned Train A essential service water outage
- November 29, 2006, planned Train A emergency diesel generator outage

- December 18, 2006, planned auxiliary feedwater pump steam generator valve testing

The inspectors completed four samples.

b. Findings

Failure to Adequately Manage Increased Risk During a Maintenance Activity

Introduction: The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) after AmerenUE failed to adequately manage the risk associated with maintenance on the turbine-driven auxiliary feedwater pump.

Description: On September 26, 2006, AmerenUE removed the turbine-driven auxiliary feedwater pump from service for planned maintenance. The licensee determined this activity increased plant risk into the next higher risk configuration (Yellow). Procedure APA-ZZ-00315, "Configuration Risk Management Program," required AmerenUE to take actions to protect redundant/diverse safety systems and components. Procedure APA-ZZ-00315 also stated that, if work could result in a risk-significant configuration or loss of system functions, consider use of physical barriers, such as ropes and/or signs to protect redundant/diverse components. AmerenUE did not take adequate protective actions or use physical barriers on the redundant Train B motor-driven auxiliary feedwater pump. Plant workers passing through the motor-driven auxiliary feedwater pump room inadvertently rendered the pump inoperable by disabling the room cooler. The licensee determined that disabling the room cooler increased plant risk into the next higher risk configuration (Orange).

Analysis: The licensee's failure to adequately manage plant risk during a maintenance activity is a performance deficiency. The inspectors determined that this finding is greater than minor because the licensee failed to implement prescribed significant compensatory measures during planned maintenance activity. This finding is similar to Example 7.g. provided in Manual Chapter 0612, Appendix E, because the auxiliary feedwater system key safety function was degraded. The inspectors used Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," Flowchart 2, "Assessment of Risk Management Actions," to analyze the finding. The inspectors calculated an incremental core damage probability of 6.8×10^{-8} for the event, based a one-hour risk exposure duration and an increase of core damage probability from 1.8×10^{-4} to 7.1×10^{-4} after the Train B motor-driven auxiliary feedwater pump inadvertently rendered the pump inoperable. The inspectors determined the finding is of very low safety significance because incremental core damage probability of 6.8×10^{-8} was less than 1.0×10^{-6} . This finding has a crosscutting aspect in the area of human performance associated with the work control component, because the licensee failed to appropriately plan work activities by incorporating risk insights and compensatory actions.

Enforcement: Section 50.65(a)(4) of Title 10 of the Code of Federal Regulations required the licensee to assess and manage the increase in risk that may result from proposed maintenance activities. Contrary to the above, on September 26, 2006, the

licensee failed to adequately manage the increase in risk that occurred during the proposed maintenance of the turbine-driven auxiliary feedwater pump. While the pump was removed from service, workers inadvertently disabled a redundant motor-driven pump, resulting in plant risk increasing past the next risk threshold. Because this issue was entered into the licensee's corrective action program (CAR 200700284), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000483/2006005-03, Failure to Adequately Manage Increased Risk During a Maintenance Activity).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

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

- October 6, 2006, OD 200608316, Degraded emergency diesel generator
- October 11, 2006, OD 200608466, Voiding in Train A safety injection discharge piping
- October 11, 2006, OD 200608766, Degraded emergency diesel generator keep-warm pump
- November 2, 2006, OD 200609111, Degraded Train B emergency diesel generator intercooler emergency service water expansion joint and OD 200608736, Train B essential service water wall thinning
- December 4, 2006, OD 200607188, nonconforming piping on residual heat removal and power-operated relief valve discharge line
- December 7, 2006, OD 200609950, Part 21 notification of potential defect affecting the emergency diesel generator electronic governor

Documents reviewed by the inspectors included:

- Residual Heat Removal 14505C, Evaluate Diesel Generator Operability/Inoperability Jacket Water Pump, June 23, 2004
- Colt-Pielstick emergency diesel generator vendor manual

- Standing Order 06-003, September 12, 2006, Immediate and Prompt Operability/Functionality Determination
- Procedure APA-ZZ-00500, Appendix 1, Prompt Operability/Functionality Determination
- Calculation ARC-585, Revision 0, EKJ04A Minimum Wall Thickness Evaluation, October 18, 2006

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modification (71111.17)

Annual Review

a. Inspection Scope

The inspectors reviewed key affected parameters associated with FSAR Change Notice 02-012, which removed the steam generator blowdown valves from FSAR Table 16.6-1, "Containment Isolation Valves." The inspectors verified that necessary Technical Specification changes have been identified and NRC approvals, if required, were obtained prior to modification implementation. The inspectors verified acceptability of the licensee's conclusions for the modification when evaluated in accordance with 10 CFR 50.59.

Documents reviewed by the inspectors included:

- NRC NUREG 800, Standard Review Plan, Revision 2
- CAR 200602142, Review of FSAR 02-0123 and FSAR Table 16.6-1
- Standing Order 06-010, Administrative Requirements for Steam Generator Blowdown Isolation and Blowdown Sample Isolation Valves, October 26, 2006
- Request for Resolution 17044, Classification of Steam Generator Blowdown Valves, Revision D, November 21, 2005

The inspectors completed one sample.

b. Findings

Failure to Obtain Prior NRC Approval Before Removing a Technical Specifications Limiting Condition for Operations

Introduction: On October 6, 2006, the inspectors identified a Green (Severity Level IV) NCV of 10 CFR 50.59 after AmerenUE failed to obtain prior NRC approval before removing the steam generator blowdown valve Limiting Condition for Operations requirement from the facility Technical Specifications.

Description: Part 50.36 of Title 10 of the Code of Federal Regulations, "Technical Specifications," required AmerenUE to establish a Limiting Condition for Operations for components that are required to mitigate a design basis accident. The Callaway Plant accident analysis required the steam generator blowdown valves to close to mitigate the steam line break accident and to ensure the auxiliary feedwater system safety function. AmerenUE met this requirement by including the blowdown valves in Technical Specification 3.6.3, "Containment Isolation Valves," as referenced in FSAR Table 16.6-1, "Containment Isolation Valves." On May 10, 2006, AmerenUE implemented FSAR Change Notice 02-012, which removed the blowdown valves from Table 16.6-1. This change removed the blowdown valves from within the scope the Technical Specifications Limiting Condition for Operations. The 50.59 safety evaluation supporting Change Notice 02-012, Request for Resolution 17044D, failed to identify that removal of the blowdown valves involved a change to the plant Technical Specifications and required prior NRC approval.

Analysis: The failure of AmerenUE to perform an adequate Section 50.59 safety evaluation for FSAR Change Notice 02-012 is a performance deficiency. This issue involved traditional enforcement because AmerenUE did not receive prior NRC approval before removing the blowdown valves from the facility Technical Specifications. Although the significance determination process is not designed to assess the significance of violations that potentially impact or impede the regulatory process, the technical result or condition of a 10 CFR 50.59 violation can be assessed through the significance determination process.

The inspectors used Inspection Manual Chapter 0612, Appendix B, to determine that the issue is more than minor because the mitigating systems cornerstone objective to maintain reliability and capability could be impacted by the removal of the blowdown valve out-of-service time limits from the Technical Specifications. The inspectors used the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet to analyze the safety significance of the violation. The inspectors concluded that the violation was of very low safety significance because the issue was not a design or qualification deficiency confirmed to result in loss of operability, did not represent a loss of system safety function or an actual loss of safety function of one or more non-Technical Specification risk-significant equipment trains, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The issue has a problem identification and resolution crosscutting aspect associated with the corrective action program because the licensee's safety evaluation did not thoroughly evaluate the change such that the resolutions address causes and extent of conditions, as necessary.

Enforcement: Part 50.59 of Title 10 of the Code of Federal Regulations, states, in part, that a licensee may make changes in the facility as described in the FSAR without obtaining a license amendment only if a change to the Technical Specifications is not

required. Contrary to this, on May 10, 2006, AmerenUE changed the FSAR to remove the Limiting Condition for Operations requirements of the steam generator blowdown valves without obtaining a license amendment. Because this issue is of very low safety significance and has been entered into the corrective action program (CAR 200608902), this violation is being treated as a Severity Level IV NCV, consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000483/2006005-04, Failure to Obtain Prior NRC Approval Before Removing a Technical Specifications Limiting Condition for Operations).

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

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

- September 5, 2006, PMT 06120099, Steam Generator D main feedwater bypass Valve AEFCV0580 repair
- September 15, 2006, PMT 708683/940, 703430/940, and 703510/940, Main steam line bypass valve preventive maintenance
- September 21, 2006, PMT 06529030, 0450352/920, and 04503526/920, Ultimate heat sink cooling tower fan motor repair
- September 22, 2006, PMT 06119804/910 and 920, Repair of voltage support capacitor Bank XNB01
- October 18, 2006, PMT 04501018/910, Preventive maintenance of the essential service water discharge strainer
- October 19, 2006, PMT 04501208/900 and PMT 06121407/910, Code repair of the emergency diesel generator lube oil cooler

Documents reviewed by the inspectors included:

- Procedure OPS-NE-00001A, Standby Diesel Generator A Periodic Tests, Revision 22

- Work Order 06119804, Replacement of the PLC in NB03, Revision 1
- CAR 200607327, Technical Specification 3.7.3 entered due to inadequate postmaintenance test
- Procedure APA-ZZ-00330, Preventive Maintenance Program, Revision 20
- Procedure PDP-ZZ-00011, Post Maintenance Testing, Revision 6

The inspectors completed six samples.

b. Findings

No findings of significance were identified

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- September 28, 2006, Surveillance 06528315, Operational reactor coolant boundary leakage test
- October 3, 2006, Environmental sampling of agricultural products
- October 3, 2006, Surveillance 04503801/910, Train B hydrogen control system, Valve GSHV0021, containment isolation valve test
- October 6, 2006, Surveillance 06529698, Reactor coolant system inventory balance
- October 19, 2006, Surveillance 06524020/500, Train A emergency diesel generator monthly test

- October 19, 2006, Surveillances 06527098 and 06527099, Inservice testing on essential service water Valves EFHV0039, EFHV0041, and EFHV0043
- November 21, 2006, Surveillance 06122315/200, Local leak rate test on containment isolation Valve EPHV8880
- December 13, 2006, Surveillance 06523962, Thermography of Train A emergency diesel generator during the monthly test
- December 29, 2006, Surveillance 06528560, Reactor trip Breaker B trip test

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three routine, two containment isolation valve, two reactor coolant system leakage, and two inservice test samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the FSAR, plant drawings, procedure requirements, and Technical Specifications to ensure that the listed temporary modification was properly implemented. The inspectors: (1) verified that the modifications did not have an affect on system operability/availability; (2) verified that the installation was consistent with modification documents; (3) ensured that the postinstallation test results were satisfactory and that the impact of the temporary modifications on permanently installed structures, systems, or components were supported by the test; (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings; and (5) verified that appropriate safety evaluations were completed. The inspectors verified that the licensee identified and implemented any needed corrective actions associated with temporary modifications.

- September 20, 2006, Temporary modification of containment coolers to support thermal performance testing. The inspectors performed a walkdown of affected equipment on September 20 and October 25, 2006

Documents reviewed by the inspectors included:

- Procedure APA-ZZ-00605, Temporary System Modifications, Revision 18

- Procedure 001CLW/051154/D06001, Thermal Performance Test of the Containment Coolers (SGN01A and SGN01C), Revision 0

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

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

a. Inspection Scope

The inspectors performed an in-office review of Revision 40 to Emergency Implementing Procedure EIP-ZZ-00101, "Classification of Emergencies," and Revision 29 to the emergency plan submitted in November 2006. The revision altered the description of Emergency Action Levels 3I and 3J for toxic gas events to clarify the initiation criteria and for consistency with the recommended wording in National Energy Institute 99-01, "Methodology for Development of Emergency Action Levels," Revision 2. The revision was also a corrective action for NCV 05000483/2006004-03, "Program Failure to Ensure Emergency Action Level Entered when Meeting the Defined Limit for Hazardous Atmosphere."

The revision was compared to the previous revision; to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1; to Nuclear Energy Institute 99-01, Revision 2; and to the standards in 10 CFR 50.47(b) to determine if the revision was adequately conducted following the requirements of 10 CFR 50.54(q). This review was not documented in a safety evaluation report and did not constitute approval of licensee changes; therefore, the revision is subject to future inspection.

The inspector completed one sample during the inspection.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

For Simulator Drill 06-06-1, conducted on November 29, 2006, which contributed to drill/exercise performance and emergency response organization performance indicators, the inspectors: (1) observed the training evolution to identify any weaknesses and deficiencies in classification, notification, and protective action requirement development activities; (2) reviewed the identified weaknesses and

deficiencies against licensee identified findings to determine whether the licensee is properly identifying failures; and (3) determined whether licensee performance is in accordance with the guidance of the Nuclear Energy Institute 99-02, "Voluntary Submission of Performance Indicator Data," acceptance criteria.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

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 three radiation, high radiation, or airborne radioactivity areas
- Radiation work permits, procedures, engineering controls, and air sampler locations
- Self-assessments, audits, licensee event reports, and special reports related to the access control program since the last inspection
- Corrective action documents related to access controls
- Radiation work permit briefings and worker instructions
- Adequacy of radiological controls such as required surveys, radiation protection job coverage, and contamination controls during job performance
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas

- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed 14 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
- ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements
- Intended versus actual work activity doses and the reasons for any inconsistencies
- Interfaces between operations, radiation protection, maintenance, maintenance planning, scheduling, and engineering groups
- Integration of ALARA requirements into work procedure and radiation work permit (or radiation exposure permit) documents
- Postjob (work activity) reviews
- Exposure tracking system
- Use of engineering controls to achieve dose reductions and dose reduction benefits afforded by shielding
- Worker use of the low dose waiting areas

- First-line job supervisor contributions 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 against these actions 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
- 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 postjob reviews and postoutage 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 by the inspectors are listed in the attachment.

The inspectors completed 10 of the required 15 samples and 10 of the optional samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Reactor Safety Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators listed below for the period from September 2004 through September 2006. The definitions and guidance of Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Revision 4, were used to verify the licensee's basis for reporting each data element in order to verify the accuracy of performance indicator data reported during the assessment period. The inspectors reviewed licensee event reports, out-of-service logs,

operating logs, and the maintenance rule database as part of the assessment. In addition, the inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution.

- Auxiliary feedwater system
- Residual heat removal system

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

.2 Occupational Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed licensee documents from August 1 through October 27, 2006. The review included corrective action documentation that identified occurrences in locked high radiation areas (as defined in the licensee's technical specifications), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in Nuclear Energy Institute 99-02). Additional records reviewed included 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 Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Revision 4, were used to verify the basis in reporting for each data element.

- Occupational Exposure Control Effectiveness

The inspectors completed the one required sample in this cornerstone.

b. Findings

No findings of significance were identified.

.3 Public Radiation Safety Cornerstone

The inspectors reviewed licensee documents from August 1 through October 27, 2006. Licensee records reviewed included corrective action documentation that identified occurrences for liquid or gaseous effluent releases that exceeded performance indicator thresholds and those reported to the NRC. The inspectors interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. Performance indicator definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Revision 4, were used to verify the basis in reporting for each data element.

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

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed the one required sample in this cornerstone.

b. Findings

No findings of significance were identified.

40A2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

.2 Selected Issue Follow-up Inspection

a. Inspection Scope

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

- August 30, 2006, CAR 200607188, Residual heat removal relief Valve EJ8708B, failed as-found surveillance test
- September 20, 2006, CAR 200607785, Violation of primary to secondary steam generator differential pressure limit
- September 27, 2006, CAR 200607977, Plant transient tracking

Documents reviewed by the inspectors included:

- Third Quarter 2006 Performance Analysis Report
- Third Quarter 2006 Callaway Quality Assurance Performance Report

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

.3 Semiannual Trend Review

a. Inspection Scope

The inspectors completed a semiannual trend review of repetitive or closely related issues that were documented in plant trend reports, problem lists, performance indicators, system health reports, quality assurance audit reports, corrective documents, and corrective maintenance documents to identify trends that might indicate the existence of more safety significant issues. The inspectors' review consisted of the 6-month period of July through December 2006. When warranted, some of the samples expanded beyond those dates to fully assess the issue. The inspectors compared and contrasted their results with the results contained in AmerenUE's quarterly trend reports. Corrective actions associated with a sample of the issues identified in the Callaway Plant Third Quarter Quarterly Performance Analysis Report (OQC-06-03) was reviewed for adequacy. The inspectors used Procedure APA-ZZ-00500, "Corrective Action Program," and 10 CFR Part 50, Appendix B, as the bases for acceptability.

NRC-Identified Adverse Trend in Problem Identification

The inspectors identified an adverse trend associated with the corrective action program threshold that plant personnel used for identifying issues. Examples included:

- Failure to identify emergency procedure issues associated with actions to initiate component cooling water to the residual heat removal heat exchangers when entering cold leg recirculation emergency core cooling mode (NCV 05000483/2006011-01)
- Failure to identify inadequate component cooling water system procedure problems for two pump operation, resulting in potential run out condition (NCV 05000483/2006011-02)
- Failure to identify inadequate safety injection system modification to prevent voiding on discharge lines (NCV 05000483/2006012-01)
- Failure to identify cause of lowering steam generator levels during forced outage resulted in main steam line water hammer event (NCV 05000483/2006012-01)
- Failure to identify adverse conditions related to containment cooler blockage (NCV 05000483/2006012-02)
- Failure to identify as an adverse condition increased dirt loading on emergency diesel air intake screens (NCV 05000483/2006012-02)

Continued Adverse Trend in Technical Rigor

The inspectors identified as an adverse trend the licensee's technical rigor when addressing plant problems during the second quarter of 2006 (Inspection Report 05000483/2006003). This trend was associated with examples of less than adequate evaluation of plant technical issues. The inspectors concluded that this adverse trend continued during the last two quarters of 2006. Recent examples included:

- Less than adequate postreactor trip evaluation (NCV 05000483/2006004-05)
- Inadequate evaluation of operator workaround resulted in loss of safety injection accumulator pressure as described in Section 4OA2 of this report (NCV 05000483/2006005-05)
- Inadequate evaluation lead to failure to monitor Valve EMHV8814 per the Maintenance Rule as described in Section 4OA2 of this report (NCV 05000483/2006005-02)
- Inadequate operability evaluation for degraded main steam isolation valve (NCV 05000483/2006012-03)
- Inadequate operability evaluation of a degraded containment cooler (NCV 05000483/2006003-06)
- Inadequate extent of condition evaluation of potential voiding of safety injection pump discharge lines (NCV 05000483/2006012-04)
- Inadequate extent of condition review and operability evaluation for failed residual heat removal suction relief Valve EJ8708B lift test focused only on cold overpressure mitigation function when addressing potential water hammer impact (CARs 200607188 and 2006010219)

b. Findings

No findings of significance were identified.

.4 Operator Workaround Review

- a. The inspectors conducted two operator workaround reviews to verify that the licensee is identifying operator workaround problems at an appropriate threshold and entering them into the corrective action program and has proposed or implemented appropriate corrective actions. The inspectors also reviewed the October 18, 2006, Operator Workaround List for accumulative affect of degraded plant equipment on the ability of operators to respond to plant events.
 - October 18, 2006, Workaround Item W-06-13, Manual relay reset operator and the corrective action plan

- December 3, 2006, CAR 200609861, Operator workaround resulted in safety injection Accumulator D pressure decreasing below the Technical Specification minimum pressure limit

The inspectors completed two workaround samples.

b. Findings

Inadequate Evaluation of an Operator Workaround Resulted in an Inoperable Safety Injection Accumulator

Introduction: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," after the licensee failed to adequately evaluate and promptly correct an operator workaround that resulted in the inoperability of a safety injection accumulator.

Description: On December 3, 2006, safety injection Accumulator D was rendered inoperable due to low pressure. The low pressure conditions occurred as plant operators attempted to add nitrogen to the accumulator. Plant operators had to work around degraded containment isolation Valve EPHV8880 and degraded pressure relief Valve EP8857 during the filling operation. Both degraded conditions were previously identified by the licensee on November 20, 2006, and documented in CAR 200609580. Operators used Procedure OTN-EP-00001, Addendum 2, "SI Accumulator Pressure Control," to pressurize the accumulator. However, to work around the degraded equipment, operators maintained upstream manual Valve KHV0046 closed. Procedure OTN-EP-00001 included a statement cautioning the operator that establishment of nitrogen pressure into the fill line, without first opening the accumulator inlet valve, was likely to lift the relief valve. Operators opened the upstream manual valve, resulting in the downstream relief valve opening due to leakage past degraded containment isolation Valve EPHV8880. Operators then opened accumulator nitrogen inlet Valve EPHV8875D, allowing the accumulator to depressurize through the open relief valve. After receiving control room alarms, operators stopped the leakage by securing the accumulator nitrogen inlet valve. However, the accumulator pressure had dropped below the minimum allowed Technical Specification pressure of 602 psig.

Analysis: Failure of operations personnel to adequately evaluate and compensate for an operator workaround is a performance deficiency. This issue is greater than minor because this finding is associated with the reactor safety mitigating systems cornerstone attribute of equipment performance and affects the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the inspectors determined that this finding is of very low significance because even though the condition did involve the loss of operability, it did not result in a loss of system safety function, did not result in loss of a single train for greater than its Technical Specification allowed outage time, and did not involve a seismic, flooding or severe weather event. This finding, which involved an inadequate evaluation of an operator workaround, has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because AmerenUE did not thoroughly evaluate problems such that resolutions address the causes and extent of conditions, as necessary.

Enforcement: Part 50 of Title 10 of the Code of Federal Regulations, Appendix B, Criterion XVI, required measures be established to assure that conditions adverse to quality, such as defective equipment, are promptly corrected. Contrary to the above, on December 3, 2006, AmerenUE did not promptly correct defective equipment associated with the safety injection accumulator nitrogen fill system. As a result, safety injection Accumulator D became inoperable due to low pressure. Because of the very low safety significance and the licensee's action to place this issue in their corrective action program (CAR 200700286), this violation is being treated as an NCV in accordance with Section VI.A.1 of the Enforcement Policy (NCV 05000483/2006005-05, Inadequate Evaluation of an Operator Workaround Resulted in an Inoperable Safety Injection Accumulator).

.5 Review of Identification and Resolution of Problems

.a Inspection Scope

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

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

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153)

.1 (Closed) Licensee Event Report (LER) 05000483/2006-003-01: Unexpected Inoperability of the Emergency Exhaust System due to Pressure Boundary Inoperability

This issue was dispositioned as a licensee-identified violation in Section 4OA7 of NRC Integrated Inspection Report 05000483/2006002. The inspectors reviewed the LER and no additional findings of significance were identified. This LER is closed.

.2 (Closed) LERs 05000483/2006-004-00 and 2006-004-01: Turbine Trip at 47 Percent Power with Rods in Auto Leads to Manual Reactor Trip and Auxiliary Feedwater Actuation

On May 12, 2006, an inadequate procedure, Procedure OTO-AC-00001, "Turbine Trip Below P-9," allowed the rod control system to decrease reactor power to a level below which the main feedwater regulating valves could adequately control steam generator level. This allowed steam generator water levels to reach the maximum allowed setpoint for feedwater pump operation, which initiated auxiliary feedwater operation and automatically tripped the main feedwater pumps. This necessitated a manual reactor trip and plant shutdown which was completed by the plant operators. This issue was dispositioned as an NCV in Section 4OA5 of NRC Integrated Inspection Report 05000483/2006004 (NCV 05000483/2006004-04). The inspectors reviewed the LER and no additional findings of significance were identified. This LER is closed.

,3 (Closed) LER 05000483/2006-006-00: Unexpected Inoperability of Train B Emergency Exhaust System due to a Failed Handswitch on the Operations Main Control Board

On August 5, 2006, auxiliary building supply Damper GLD0047 failed to close as expected during surveillance testing. The damper failed to close due to foreign material in the handswitch. The foreign material originated from a control panel modification performed in 1982. The licensee entered the conditions into the corrective action program as CAR 200606369. The inspectors reviewed the LER and no findings of significance were identified. This LER is closed.

.4 (Closed) LER 05000483/2006-007-00 and 2006-007-01: Inoperability of Train A Containment Cooler Longer than Allowed by Technical Specifications

On August 7, 2006, NRC inspectors identified that containment cooler Train A was inoperable for greater than the allowed Technical Specification out-of-service time due to fouling. This issue was dispositioned as an NCV in Section 1R15 of NRC Integrated Inspection Report 05000483/2006003 (NCV 05000483/2006003-06). The inspectors reviewed the LER and no additional findings of significance were identified. This LER is closed.

4OA4 Temporary Instruction 2515/169: Mitigating Systems Performance Index

a. Inspection Scope

The inspectors reviewed system unavailability data to verify that the licensee correctly implemented the mitigating systems performance index guidance for reporting unavailability and unreliability of the monitored safety systems. The inspectors reviewed system maintenance and test history to confirm the accuracy of the failure data (demand failures, run/load failures, and failures to meet the risk-significant mission time, as applicable) for the identified monitored components.

b. Findings

No findings of significance were identified. The inspectors did not identify significant errors in the reported data. For the sample selected, the inspectors concluded that AmerenUE:

- Accurately documented the baseline planned unavailability hours for the mitigating systems' performance index systems
- Accurately documented the actual unavailability hours for the mitigating systems' performance index systems
- Accurately documented the actual unreliability information for each mitigating systems' performance index monitored component

Temporary Instruction 2515/169 is closed.

4OA5 Other Activities

(Closed) Unresolved Item (URI) 05000483/2006004-01: Interpretation of Scrams with Loss of Normal Heat Removal Performance Indicator

The inspectors previously identified an issue related to the exclusion of reactor trips on February 15, 2004, and May 12, 2006, from the loss of normal heat removal performance indicator. Both of these reactor trips involved the loss of the main feedwater pumps prior to the reactor scram. This issue was unresolved (URI 05000483/2006004-01) pending additional NRC review.

The NRC determined that neither of these reactor trips needed to be included in the performance indicator because loss of the normal heat removal path was easily recoverable from the control room without the need for diagnosis or repair. At the Callaway Plant, every reactor trip involves a loss of the main feedwater pumps. By design, the normal heat removal path can be restored from the control room without significant diagnosis. The inspectors have no additional concerns related to this issue and the unresolved item is closed.

4OA6 Management Meetings

Exit Meetings

On October 31, 2006, the inspectors conducted a telephonic inspection exit and presented the occupational radiation safety inspection results to Mr. L. Graessle, Regulatory Affairs Manager, and other members of his staff who acknowledged the findings.

On November 27, 2006, the emergency preparedness inspector presented the results of the emergency plan change review inspection to Mr. K. Bruckerhoff, Supervisor, Emergency Preparedness.

On January 3, 2007, the inspector conducted a telephonic exit meeting to present the inspection results to Mr. D. Hopkins, Training Manager, who acknowledged the findings.

On January 9, 2007, the resident inspectors presented the results of their inspection to Mr. A. Heflin, Vice President, and other members of his staff who acknowledged the findings.

The inspectors confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Antweiler, Construction Supervisor, Nuclear Engineering Technical Support Reliability Group
K. Bruckerhoff, Supervisor, Emergency Preparedness
R. Farnam, Radiation Protection Manager
K. Gilliam, Radiation Protection Supervisor, ALARA
A. Heflin, Vice President
B. Huhmann, Supervising Engineer, Nuclear Systems, Mechanical
G. Hurla, Radiation Protection Supervisor, Operations
K. Mills, Supervising Engineer, Regional Regulatory Affairs/Safety Analysis
V. Rider, ALARA Specialist

LIST OF ITEMS OPENED AND CLOSED

Closed

05000483/2006-003-01	LER	Unexpected Inoperability of the Emergency Exhaust System due to Pressure Boundary Inoperability (Section 4OA3)
05000483/2006-004-00	LER	Turbine Trip at 47 Percent Power with Rods in Auto Leads to Manual Reactor Trip and Auxiliary Feedwater Actuation (Section 4OA3)
05000483/2006-004-01	LER	Turbine Trip at 47 Percent Power with Rods in Auto Leads to Manual Reactor Trip and Auxiliary Feedwater Actuation (Section 4OA3)
05000483/2006-006-00	LER	Unexpected Inoperability of Train B Emergency Exhaust System due to a Failed Handswitch on the Operations Main Control Board (Section 4OA3)
05000483/2006-007-00	LER	Inoperability of a Containment Cooler Longer Than Allowed by Technical Specifications (Section 4OA3)
05000483/2006-007-01	LER	Inoperability of A Containment Cooler Longer Than Allowed by Technical Specifications (Section 4OA3)
05000483/2006004-01	URI	Interpretation of Scrams with Loss of Normal Heat Removal Performance Indicator (Section 4OA5)
2515/169-05	TI	Mitigating Systems Performance Index (Section 4OA4)

Opened and Closed

05000483/2006005-01	NCV	Failure to Identify a Degraded Fire Barrier (Section 1R05)
05000483/2006005-02	NCV	Failure to Properly Categorize a Maintenance Preventable Functional Failure (1R12)
05000483/2006005-03	NCV	Failure to Adequately Manage Increased Risk During a Maintenance Activity (Section 1R13)
05000483/2006005-04	NCV	Failure to Obtain Prior NRC Approval Before Removing a Technical Specifications Limiting Condition for Operations (Section 1R17)
05000483/2006005-05	NCV	Inadequate Evaluation of an Operator Workaround Resulted in an Inoperable Safety Injection Accumulator (Section 4OA2)

DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

OSP-EF-00001, Service Water Valve Lineup Verification, Revision 5

OSP-EF-0003B, Train B Ultimate Heat Sink Cooling Tower Fans Test, Revision 4

OSP-EF-00004, Ultimate Heat Sink Riprap Inspection, Revision 1

OTN-EF-00001, Essential Service Water System, Revision 27

OSP-EN-00001, Containment Spray Systems Tests, Revision 6

OSP-EN-P001A, Containment Spray Pump A Inservice Test, Revision 24

OSP-EN-P001B, Containment Spray Pump B Inservice Test, Revision 26

OSP-EN-V001A, Train A Containment Spray Valve Operability, Revision 17

OSP-EN-V001B, Train B Containment Spray Valve Operability, Revision 16

OSP-EN-V0002, Section XI Containment Spray Encapsulated Isolation Valve Operability, Revision 12

OTN-EN-00001, Containment Spray System, Revision 10

Section 1R05: Fire Protection

Procedures

APA-ZZ-00700, Fire Protection Program, Revision 13

APA-ZZ-00701, Control of Impairments of Fire Protection Systems and Components, Revision 13

Callaway Action Requests

CAR 200606527, October 18, 2006, Deluge Valve KCXV0365 dumped and electric fire pump started

CAR 200607547, September 11, 2006, Spurious alarm in the upper cable spreading room

CAR 200608918, October 27, 2006, Automatic actuation of the upper cable spreading room deluge

CAR 200608947, October 29, 2006, Adverse Trend - Upper cable spreading room spurious fire protection alarms

Programs

Combustible/Electrical Fire Hazards Analysis Program for Fire Area A-19, Revision 23
Combustible/Electrical Fire Hazards Analysis Program for Fire Area A-20, Revision 14

Miscellaneous

FSAR Section 9.5.B, Fire Hazards Analysis

Section 1R22: Surveillance Testing

Procedures

OSP-BB-00009, RCS Inventory Balance, Revision 13

OSP-BB-00010, RCS Operational Leakage Measurement, Revision 9

OSP-EF-V001A, Essential Service Water Train A Valve Operability, Revision 30

OSP-EP-LLP45, Containment Isolation Valve Leak Rate Test, Revision 5

OSP-GS-V002B, Hydrogen Control System Train B Valve Operability, Revision 5

OSP-NE-0001A, Standby Diesel Generator A Periodic Tests, Revision 23

OSP-SB-0001B, Reactor Trip Breaker B Trip Actuating Device Operational Test, Revision 14

Section 2OS1: Access Controls to Radiologically Significant Areas

Callaway Action Requests

200608083	200608084	200608095	200600355	200601364	200601371
200604785	200606406	200606538			

Audits and Self-Assessments

SA06-RP-F01, HRA/LHRA/VHRA Posting, Access, and Controls, February 2006

Radiation Work Permits

603322SLUICE, Transfer Resin from the Primary Spent Resin Storage Tank to Liner

Procedures

HTP-ZZ-06001, High Radiation/Very High Radiation Area Access, Revision 25

HDP-ZZ-03000, Radiological Survey Program, Revision 24

HDP-ZZ-01500, Radiological Postings, Revision 20

APA-ZZ-01004, Radiological Work Standards, Revision 4

HTP-ZZ-01203, Radiological Area Access Control, Revision 32

HTP-ZZ-03100, Performing Radiation Surveys, Revision 4

Section 2OS2: ALARA Planning and Controls

Callaway Action Requests

200600209	200600595	200601246	200604989	200605633	200606344
200607010	200607459	200607691			

Audits and Self-Assessments

SA06-RP-F03, Radiation Work Permits, June 2006

Radiation Work Permits

603322SLUICE, Transfer Resin from the Primary Spent Resin Storage Tank to Liner

732000SGT21, Crane Operations Inside Reactor Building

732000SGT09, Installation/Removal of Temporary Services

732000SGT26, Residual Heat Removal Check Valve Modifications

732000SGT15, Secondary Cutting and Welding

Procedures

HDP-ZZ-01100, ALARA Planning and Review, Revision 3

APA-ZZ-01004, Radiological Work Standards, Revision 4

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

HDP-ZZ-01200, Radiation Work Permits, Revision 6

HTP-ZZ-01104, Hot Spot Trending Program, Revision 4

Miscellaneous Documents

Plant ALARA Review Committee Meeting Minutes for the following dates; August 24, September 18, 19, and 26, 2006

RFO14 ALARA Report

Callaway Plant Long Range Dose and Source Term Reduction Plan, August 2006

Section 4OA1: Performance Indicator Verification (71151)

Corrective Action Documents

200600595 200601759 200603190 200607794 200607925 200605572

Procedures

RRA-ZZ-0001, NRC Performance Indicator Program, Revision 2