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

November 5, 2005

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

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2005004

Dear Mr. Naslund:

On September 23, 2005, the NRC completed an inspection at your Callaway Plant. The enclosed report documents the inspection findings which were discussed on September 26, 2005, with you and other members of your staff.

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

This report documents two findings that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that violations are associated with these issues. These violations are being treated as noncited violations (NCVs), consistent with Section VI.A of the Enforcement Policy. In addition, an apparent violation was identified for the failure to adequately implement a procedure for cold overpressure mitigation configurations control. The NRC is performing a significant determination process Phase 3 review to determine the safety significance. The NCVs and AV are described in the subject inspection report. If you contest these violations or 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).

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

Sincerely,

/RA/

William B. Jones, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

Enclosure:
NRC Inspection Report
05000483/2005004`
w/attachment: Supplemental Information

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-483
License:	NPF-30
Report:	05000483/2005004
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, Missouri
Dates:	June 24 through September 23, 2005
Inspectors:	M. S. Peck, Senior Resident Inspector D. E. Dumbacher, Resident Inspector E. A. Owen, Reactor Inspector G. A. Pick, Senior Reactor Inspector, Engineering Branch 2
Approved By:	W. B. Jones, Chief, Project Branch B

SUMMARY OF FINDINGS

IR 05000483/2005004; 06/24 - 9/23/2005; Callaway Plant: Personnel Performance During Nonroutine Plant Evolutions, Operability Evaluations, and Identification and Resolution of Problems

This report covered a 3-month inspection by region based reactor inspectors and resident inspectors. Two Green noncited violations and an apparent violation 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. A self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," was identified after AmerenUE failed to properly align the turbine driven auxiliary feedwater pump mechanical overspeed trip mechanism after surveillance testing. The trip mechanism was misaligned from August 1 - 18, 2005. The misaligned trip mechanism increased the probability the turbine would trip if the pump would have been required to respond to an event. This issue was entered into the corrective action program as Callaway Action Request 200505801. This finding, which involved the failure of an operator to follow procedure, was associated with the crosscutting area of human performance.

  This finding is greater than minor because the degraded trip mechanism affected the reactor mitigating systems cornerstone and the equipment performance attribute to ensure availability of systems that respond to prevent core damage. This finding is only of very low safety significance because the condition was not a design or qualification deficiency confirmed to result in loss of function per Generic Letter 91-18; did not result in an actual loss of safety function of a system; did not increase the likelihood of a fire; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event (Section 1R15).

Cornerstone: Barrier Integrity

- TBD. A self-revealing apparent violation of Technical Specification 5.4.1.a, "Procedures," was identified after an operator error resulted in the failure to maintain the required cold overpressure mitigation system configuration while the reactor was in Mode 5. Technical Specification 3.4.12, "Cold Overpressure Mitigation System," prohibited more than one centrifugal charging pump from being capable of injecting into the reactor vessel. An operator inadvertently defeated administrative controls and enabled a centrifugal charging pump during a diesel generator and sequencer test restoration lineup on September 20, 2005. Contributing causes to the event were

inadequate procedural controls and pre-job brief. This issue was entered into the corrective action program as Callaway Action Request 200507092. This finding, which involved the failure of an operator to follow procedure, was associated with the crosscutting area of human performance.

This finding is greater than minor because, if left uncorrected, it would have become a more significant safety concern involving the integrity of the reactor coolant system boundary (barrier integrity cornerstone). The finding was evaluated using Manual Chapter 0609, "Significance Determination Process," Appendix G, Shutdown Operations Significance, Checklist 2. Although the performance deficiency did not result in a Technical Specification violation, discussions with the Office of Nuclear Reactor Regulation identified a Phase 3 analysis should be performed and is currently under evaluation (Section 1R14).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, "Corrective Action," after ineffective corrective actions resulted in a repeat degradation of a control building emergency ventilation habitability boundary door. AmerenUE's work control organization twice authorized work on the essential switchgear room to emergency diesel generator room door without approval of the shift operations department. As a result, shift operations did not understand that the habitability boundary had been compromised by the maintenance. This finding, which involved ineffective corrective actions to prevent the repeat degradation of the ventilation system habitability boundary door, was associated with the crosscutting area of problem identification and resolution.

  This finding was greater than minor because it was associated with the integrity of the control building pressure envelope in that the degraded door would not meet its habitability function. The finding was only of very low safety significance because the finding only represented a degradation of the radiological barrier function provided for the control room (Section 4OA2).

REPORT DETAILS

Summary of Plant Status: At the beginning of the inspection period, the Callaway Plant was operating at full power. AmerenUE incurred an unplanned power reduction to 65 percent on June 28, 2005 following a main feed pump control failure. AmerenUE completed control system repairs and returned the plant to full power on June 29, 2005. AmerenUE operated the plant at full power until performing a normal shutdown on September 17, 2005, for refueling Outage 14. The plant remained shutdown the remainder of the inspection period.

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

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

The inspectors reviewed AmerenUE's site preparation and actions for actual extreme hot weather conditions (one inspection sample). The inspectors performed a detailed review of the station's adverse weather Procedures EIP-ZZ-00231, "Response to Severe Thunderstorms/High Winds/Tornado Watches and Warnings," and OTN-EF-00001, "Essential Service Water System," Section 5.10, "Using Essential Service Water (ESW) to Reduce Containment Temperatures." The inspectors also performed a review of the containment air temperature controls and the ultimate heat sink temperature controls to verify that AmerenUE properly implemented required administrative and Technical Specification (TS) controls. The inspectors performed the walkdown on July 25, 2005, when air temperatures reached 104 degrees.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial System Walkdowns. The inspectors completed three partial system walkdowns during the inspection period (three inspection samples). The inspectors performed the walkdowns to verify component alignment and subsystem operability. The inspectors used the Final Safety Analysis Report (FSAR), TSs, and the procedures and drawings listed in the attachment as the bases for acceptability. The following systems were included in the scope of this inspection:

- Residual heat removal (RHR) system, Train A while the redundant train was out of service for scheduled testing. The inspectors walked down components located in the auxiliary and control buildings on August 31 and September 1, 2005.

- Containment cooling system, Train B on September 8 and 12, 2005. The inspectors walked down components in the auxiliary building and containment including the cooling coils while at power.

- Charging and safety injection systems cold overpressure mitigation protection alignments on September 19, 2005.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

Routine Fire Inspection Walkdowns

a. Inspection Scope

The inspectors performed twelve fire zone walkdowns to verify that AmerenUE maintained plant areas in accordance with the Fire Hazards Analysis Report (twelve inspection samples). The fire zones were chosen based on their risk significance as described in the individual plant examination of external events. The walkdowns focused on control of combustible materials and ignition sources, operability and material condition of fire detection and suppression systems, and the material condition of passive fire protection features. The following fire zones were inspected:

- Fire Area A-7, Boron injection room, June 30, 2005
- Fire Area F-1, Fuel building general areas, July 11, 2005
- Fire Area A-4, Train A emergency core cooling room, July 15, 2005
- Fire Area A-2, Train B emergency core cooling room, July 15, 2005
- Fire Area A-23, Containment isolation valve room (north), July 15, 2005
- Fire Area A-24, Containment isolation valve room (south), July 15, 2005
- Fire Area C-28, Service area, September 20, 2005
- Fire Area C-29, Secondary alarm station, September 20, 2005
- Fire Area C-14, Class 1E air conditioning equipment room, September 20, 2005
- Fire Area C-11, South cable chases, September 21, 2005
- Fire Area C-12, North cable chases, September 21, 2005
- Fire Area C-31, North vertical cable chase, September 23, 2005

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors completed one external flood protection walkdown during the inspection period (one inspection sample). The inspectors walked down both 1974 foot elevation auxiliary building and control building sumps, plant exterior at grade level, and the ESW pump houses on September 16 and 19, 2005. The inspectors performed the walkdown to review plant configuration for susceptibility to external flooding, such as that caused by heavy rains or flash flooding. The inspectors conducted the walkdowns to verify that AmerenUE had implemented adequate protection for equipment below the postulated flood line, including electrical conduits, holes, and wall penetrations. The inspection included common drains, sumps, sump pumps, level alarms, and control circuits. The inspectors also reviewed Callaway Action Request (CAR) 200502980, "Evaluate Ground Water Recovery System," and engineering evaluation RFR 15336E to ensure an adequate ground water recovery system was being maintained. The inspectors used FSAR Section 2.4, "Hydrological Engineering," as the basis for acceptability of the observed plant configuration.

b. Findings

No findings of significance were identified.

1R07 Biennial Heat Sink Performance (71111.07B)

a. Inspection Scope

The inspectors reviewed design documents (e.g., calculations and performance specifications), program documents, implementing documents (e.g., test and maintenance procedures), and corrective action documents. The inspectors interviewed chemistry personnel, maintenance personnel, engineers, and program managers.

For heat exchangers directly connected to the safety-related service water system, the inspectors verified whether testing, inspection and maintenance, or the biotic fouling monitoring program provided sufficient controls to ensure proper heat transfer. Specifically, the inspectors reviewed: (1) heat exchanger test methods and test results from performance testing, (2) if necessary, heat exchanger inspection and cleaning methods and results, and (3) chemical treatments for microfouling and controls for macrofouling.

For heat exchangers directly or indirectly connected to the safety-related service water system, the inspectors verified the: (1) condition and operation consistent with design assumptions in the heat transfer calculations, (2) potential for water hammer, as applicable, (3) vibration monitoring controls for the heat exchangers, (4) chemistry controls for heat exchangers indirectly connected to the safety-related service water

system, and (5) redundant and infrequently used heat exchangers are flow tested periodically at maximum design flow.

For the ultimate heat sink and its subcomponents, the inspectors reviewed the following requirements: (1) capacity of the reservoir, (2) macrofouling controls, (3) biotic fouling controls, (4) controls for ensuring functionality during adverse conditions, and (5) performance tests for pumps and valves.

If available, the inspectors reviewed additional nondestructive examination results for the selected heat exchangers that demonstrated structural integrity.

The inspectors selected heat exchangers that ranked high in the plant specific risk assessment and were directly or indirectly connected to the safety-related service water system. The inspectors selected the following specific heat exchangers:

- P645732, EEG01A Component Cooling Water Heat Exchanger A, performed on October 23, 2002
- P660945, KKJ01B Diesel Generator B coolers, performed on August 14, 2003
- P700637, SGN01B Containment Cooler B, performed on June 9, 2004
- P715273, SGL15A Penetration Room Cooler A, performed on August 25, 2004

The inspectors reviewed four samples and completed three of the required two to three samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Activities Review by Resident Staff (71111.11Q)

a. Inspection Scope

The inspectors observed one licensed operator simulator training **exercise** and critique (one inspection sample). The inspectors observed **the exercise** to assess operator performance during high-risk operator actions, implementation of the site emergency plan, and industry operating experience (OE). The inspectors observed licensed operators when they responded to a steam generator tube rupture, with the loss of onsite power, training scenario on August 10, 2005.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q)

a. Inspection Scope

The inspectors reviewed two samples of equipment maintenance problems (two inspection samples). The inspectors performed the review to verify that AmerenUE effectively implemented 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The inspectors focused on maintenance rule characterization of failed components, risk significance, determination of the (a)(1) classification, corrective actions, and the appropriateness of performance goals and monitoring criteria. The inspectors also evaluated emergent equipment issues to determine if problems were identified at the appropriate level and entered into the corrective action program. The inspectors used Administrative Procedure EDP-ZZ-01128, "Maintenance Rule Program," Revision 6, during the review. The inspectors performed an in-office review of the following Maintenance Rule (a)(1) evaluations:

- CARs 200505224 and 200506294, DSK33021 Diesel B door found not latched
- CAR 200504286, Failure of volume control tank level Transmitter BG-LT-0149

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed four risk assessments for planned or emergent maintenance activities to verify that AmerenUE met the requirements of 10 CFR 50.65(a)(4) for assessing and managing increases in plant risk (four inspection samples). The inspectors compared AmerenUE's risk assessment and risk management actions against the requirements of 10 CFR 50.65(a)(4); the recommendations of Nuclear Management and Resource Council 93-01, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3; and Engineering Department Procedure EDP-ZZ-01129, "Callaway Plant Risk Assessment." The inspectors reviewed the following risk assessments:

- Preventative maintenance and testing of the turbine-driven auxiliary feedwater pump (TDAFP) on August 1, 2005. The inspectors observed AmerenUE's risk contingency activities from the control room and auxiliary building.

- Unplanned inoperability of the TDAFP due to a misalignment of the overspeed trip mechanism coincident with essential 4 kV load shed sequence testing on August 18, 2005. The inspectors observed AmerenUE's risk management activities from the control room and auxiliary building.

- Planned RHR Train A outage on August 23 and 24, 2005. The inspectors observed AmerenUE's risk management activities from the control room.

- The reactor coolant system (RCS) initial drain down (during refueling outage) to the reactor vessel flange on September 20, 2005. The inspectors observed AmerenUE's risk management activities from the control room and auxiliary and reactor buildings.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions (71111.14)

a. Inspection Scope

The inspectors reviewed two non-routine plant events for personnel performance (two inspection samples). The inspectors reviewed each event to verify proper operator response. The inspectors used operator logs, plant computer data, charts, and condition adverse to quality documents to determine what occurred, how the operators responded, and whether the responses were in accordance with plant procedures. The inspectors selected the following events:

- Rapid power reduction due to the failure of a main feed pump turbine speed control on June 28, 2005 (CAR 200504493)

- Failure to maintain a centrifugal charging pump incapable of injection during cold shutdown on September 20, 2005 (CAR 200507092)

b. Findings

Failure to Maintain Cold Overpressure Mitigation Measures

Introduction. A self-revealing apparent violations of TS 5.4.1.a, "Procedures," was identified after an operator error resulted in the failure of AmerenUE to maintain the cold overpressure mitigation system configuration while in Mode 5.

Description. An operator error resulted in both centrifugal charging pumps being capable of injecting into the reactor while in Mode 5. Technical Specification 3.4.12, "Cold Overpressure Mitigation System," prohibited more than one centrifugal charging pump from being capable of injecting into the reactor vessel while in Mode 5. AmerenUE used Procedure OSP-BG-00002, "COMS-Verify One Centrifugal Charging Pump Incapable of Injecting into RCS," to isolate and administratively control the centrifugal charging pump flow path while in Mode 5. Using Procedure OSP-BG-00002, AmerenUE isolated and locked the Train A centrifugal charging pump discharge valve and hung a placard describing the requirement to maintain the valve closed.

AmerenUE performed Procedure ISP-SA-2413A, “Diesel Generator and Sequencer Testing (Train A),” on September 20, 2005. After the completion of the test, the test director gave directions to an auxiliary operator to restore the system lineup. Procedure ISP-SA-2413A included a step to open the Train A charging pump discharge valve. The test director recognized that the discharge valve needed to remain isolated for compliance with TS 3.4.12. The test director crossed out the step to open the discharge valve on the system restoration sheet. However, the auxiliary operator used a different copy of the procedure which did not have the step crossed out. The operator ignored the administrative controls and unlocked and opened the discharge valve. The auxiliary operator returned the placard and lock to the test director. The test director recognized the inappropriate configuration and immediately had the improper alignment corrected. The inspectors determinated that a less than adequate test procedure, a poor pre-job brief, and poor supervisory direction contributed to this event.

Analysis. AmerenUE’s failure to establish and follow adequate procedures was a performance deficiency. This finding affected the barrier integrity cornerstone and the configuration control, procedure quality, and human performance attributes of maintaining functionality of the RCS. This finding is greater than minor because, if left uncorrected, it would have become a more significant safety concern involving the integrity of the reactor coolant system. The inspectors used the shutdown operation situation's, Manual Chapter 0609, Significance Determination Process, Appendix G, Shutdown Operations Significance, Checklist 2. Although the condition only represented a degradation of the licensee controls to the barrier function and did not result in a noncompliance with low-temperature overpressure protection (LTOP) TS, discussion with the Office of Nuclear Reactor Regulation (NRR) identified that a Phase 3 analysis should be performed. This finding is currently under review by NRR. This finding, which involved the failure of an operator to follow procedure, inadequate briefing and a less than adequate test procedure, was associated with the crosscutting area of human performance.

Enforcement. Technical Specification 5.4.1.a, “Procedures,” required the written procedures specified in Regulatory Guide 1.33, Appendix A, to be implemented. Appendix A required procedures for shutdown, appropriate for the RCS, to be implemented. Procedure OSP-BG-00002 required AmerenUE to ensure only one centrifugal charging pump was capable of injecting to the RCS. Contrary to the above, AmerenUE did not ensure only one centrifugal charging pump was capable of injecting to the RCS. Pending determination of the final safety significance of this issue, this issue is being treated as an AV consistent with Section VI.A of the NRC Enforcement Policy. This issue was entered into AmerenUE's corrective action program (CAR 200507092) (AV 05000483/2005004-01).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed seven operability determinations involving risk significant equipment during the inspection (seven inspection samples). The inspectors reviewed the technical adequacy of the operability determinations to verify that operability was justified and compensatory measures were appropriate and controlled. The inspectors reviewed plant status documents such as operator shift logs, emergent work documentation, deferred modifications, and standing orders to determine if an operability determination was warranted for degraded components. The inspectors used the FSAR, TSs, and design basis documents as the bases to determine the technical adequacy of licensee prepared operability determinations. The inspectors reviewed the following equipment conditions and associated operability determinations:

- Operability Determination 200505194, Unanalyzed differential pressure across RHR sump Valves EJHV8811A and EJHV8811B, on July 28, 2005
- Operability Determination 200505224, Degraded control room gas treatment boundary, on July 27, 2005
- Operability Determination 200505701, Degraded diaphragm and regulator on ESW Valve EFHV0044, on August 15, 2005
- Operability Determination 200505801, Degraded TDAFP trip throttle Valve FCHV0312 discovered out of alignment, on August 18, 2005
- Operability Determination 200505994, Degraded ESW flow across the component cooling water heat exchanger, on August 25, 2005
- Operability Determination 200206245, Containment cooler standpipe level control valve not closing properly, on August 26, 2005
- Operability Determination 200409571, Failure of main steam isolation Valve C four-way valve, on December 29, 2004 (Unresolved Item 05000483/2005002-05). This unresolved item is closed in Section 40A5 of this report.

b. Findings

.1 Misalignment of the TDAFP due to Personnel Error

Introduction. A self-revealing Green NCV of TS 5.4.1.a, “Procedures,” was identified after AmerenUE failed to properly align the TDAFP mechanical overspeed trip

mechanism after surveillance testing. The misaligned trip mechanism increased the probability that the turbine would trip if the pump would have been required to respond to an event.

Description. AmerenUE failed to properly reset the TDAFP mechanical overspeed trip mechanism after surveillance testing on August 1, 2005. A plant engineer identified the misaligned trip linkage on August 18, 2005. The mechanical trip system used a weight attached to the outboard end of the turbine shaft to push a tappet if an overspeed condition was reached. The tappet nut held the trip and throttle valve trip rod in position. When the weight extended and hit the tappet, the tappet nut and head lever disengaged, allowing spring tension to move a rod, which in turn closed the trip and throttle valve. The tappet nut is required to be reset locally.

Procedure OOA-ZZ-SEC06, "Turbine Building Area 5 Operator Aid," Revision 6, specified that the trip linkage head lever must rest against the flat side of the tappet nut when the overspeed trip was reset. The beveled portion of the tappet nut was misaligned when locally reset on August 1, 2005. The misalignment resulted in less than the necessary contact surface between the tappet nut and head lever to hold the trip mechanism open. However, a small burr on one of the contact surfaces created enough friction to prevent the trip mechanism from closing the trip and throttle valve. The trip linkage misalignment resulted in increased probability of an inadvertent TDAFP trip during accident conditions.

Analysis. AmerenUE's failure to properly reset the turbine mechanical overspeed trip mechanism after surveillance testing was a performance deficiency. The inspectors used the at-power significance determination process to analyze this finding. This finding is greater than minor because the degraded trip mechanism affected the reactor mitigating systems cornerstone and the equipment performance attribute to ensure availability of systems that respond to prevent core damage. This finding is only of very low safety significance because the condition was not a design or qualification deficiency confirmed to result in loss of function per Generic Letter 91-18; did not result in an actual loss of safety function of a system; did not increase the likelihood of a fire; and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding, which involved the failure of an operator to follow procedure, was associated with the crosscutting area of human performance.

Enforcement. Technical Specification 5.4.1.a required written procedures specified in Regulatory Guide 1.33, Appendix A, to be implemented. Appendix A, required procedures for operation of auxiliary feedwater systems to be implemented. Procedure OOA-ZZ-SEC06 provided for operation of the TDAFP and required that the operator verify the tappet nut was completely seated when resetting the turbine mechanical overspeed trip mechanism. Contrary to the above, on August 1, 2005, the operator did not verify the tappet nut was completely seated when resetting the turbine mechanical overspeed trip mechanism. Because this finding is of very low safety

significance and was entered into AmerenUE's corrective action program (CAR 200505801), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000483/2005004-02).

.2 Potential Failure of the RHR Containment Suction Valves During Certain Design Bases Events

Introduction. The inspectors are reviewing AmerenUE's actions associated with the RHR containment suction valves as an unresolved item. This issue will remain unresolved pending additional review by the inspectors. No analysis or enforcement reviews were performed for this unresolved item.

Description. AmerenUE's analyzed maximum differential pressure between the containment recirculation sump and RHR systems was not the limiting case. AmerenUE used this maximum differential pressure value to ensure that the containment recirculation sump RHR suction valve actuators were capable of opening during all design bases accidents. The RHR system suction path was designed to automatically transfer to the containment recirculation sumps after the refueling water storage tank level deceases to thirty-six percent. The RHR containment sump valves must open for the transfer to occur. The reactor operator subsequently aligns the RHR pump discharge to the safety injection and high head emergency core cooling pump suctions to ensure adequate net positive suction head for the cold leg recirculation phase of accident mitigation. AmerenUE concluded a 53 psid maximum differential pressure for the RHR sump valves in Calculation RFR 05353, Revision F. However, during some small and medium size loss of coolant accidents, the RHR suction pressure may exceeded the 53 psid maximum differential pressure analyzed by AmerenUE. During these accident conditions, the reactor pressure may stay above the 195 psig discharge pressure of the RHR pumps. Flow from the RHR heat exchanger outlet would be diverted back to the pump suction. A minimum flow valve automatically opens to ensure RHR pump discharge flow is maintained at least 816 gpm. Based on the pump curve, the RHR pump will develop a 215 psid head at 816 gpm. The RHR suction configuration also included a relief valve capable of passing 700 gpm at 450 psig.

AmerenUE evaluated OE from the Catawba and McGuire (CAR 200504370) plants during June 2005. This OE alerted the industry to the potential of higher than previously considered differential pressure across the RHR sump valves. In response to the OE, AmerenUE operated the RHR pumps for about 30 minutes in the minium flow configuration and observed 189 psid across the sump valve. AmerenUE concluded that the valve actuator would still open based on a linear extrapolation of the actuator torque at the higher differential pressure. The inspectors determined that, based on the 215 psid developed RHR pump head with no condensable gases present in the system, differential pressures greater than 189 psid are possible in the RHR suction line. Additionally, Westinghouse Calculation WCAP 13097, Revision 0, Section 1.2, "Design Basis Review," recommended that 464 psid differential pressure generically be used for sizing the containment sump valve actuator torque. This issue is considered unresolved

pending additional inspector review of the supporting RHR differential pressure calculations and of current and past RHR sump valve operability (Unresolved Item 05000483/2005004-03) .

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed two risk significant post maintenance tests to verify that AmerenUE adequately demonstrated the safety function of components affected by maintenance activities (two inspection samples). The inspectors verified that testing procedures were properly reviewed and approved and incorporated appropriate acceptance criteria. The inspectors used information in the TSs, the FSAR, and Section XI of the American Society of Mechanical Engineers Code, as the bases for acceptability of sampled postmaintenance tests. The inspectors completed an in-office review of the completed work packages. The sample included the following post maintenance tests:

- PMT 05101938/910, PMT 718923/904, and PMT P973710/910, after emergency core cooling room cooler and Valve HBHV7150 maintenance on August 23, 2005

- PMT P721525/910 and PMT 721525/910, after RHR pump motor maintenance on August 23, 2005 (pump, room cooler, and Valve EJHV0610)

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors evaluated and observed selected refueling outage activities to ensure that AmerenUE appropriately considered plant risk when developing outage schedules and adequately controlled plant configuration. The inspectors also reviewed refueling activities to verify that AmerenUE developed appropriate mitigation strategies for losses of key safety functions and complied with the operating license and TS requirements.

Outage Plan Review

Prior to the outage, the inspectors performed an in-office review of the refueling risk analysis and schedule to verify that AmerenUE appropriately considered risk, industry experience, and previous site-specific problems. The inspectors compared AmerenUE's outage plan with Administrative Procedure APA-ZZ-00150, "Outage Preparation and Execution," Revision 15, and Nuclear Utility Management and Resource Council 91-06,

"Guidelines for Industry Actions to Assess Shutdown Management," December 1991, as a basis for acceptability. The inspectors also reviewed refueling activities against the requirements of Procedure APA-ZZ-00322, "Integrated Work Management Process Description," Revision 1.

Monitoring of Shutdown Activities

The inspectors reviewed the RCS cooldown on September 17, 2005, to verify that AmerenUE did not exceed TS cooldown limits. The inspectors compared the plant cooldown data against Procedure OTG-ZZ-0006, "Plant Cooldown Hot Standby to Cold Shutdown," Revision 6 and the Curve Book, Figure 8-6, "RCS Pressure-Temperature Limitations."

Licensee Control of Outage Activities

The inspectors verified that AmerenUE maintained key safety functions and applicable TSs when taking equipment out of service and transitioning the plant. The inspectors attended daily outage status meetings and observed AmerenUE's control of outage activities to verify that defense-in-depth risk was commensurate with the outage risk control plan. The inspectors compared AmerenUE's evaluation of emergent work risk with Engineering Department Procedure EDP-ZZ-1129, "Callaway Plant Risk Assessment," Revision 8; and Nuclear Utility Management and Resource Council 91-06, "Guidelines for Industry Actions to Assess Shutdown Management."

Inventory Control

The inspectors observed the RCS drain down from the control room on September 20, 2005, to verify that the flow paths, configurations, and alternative means for inventory addition were consistent with the outage risk plan. The inspectors verified AmerenUE's "Limited Inventory Controls" contingencies were implemented prior to the RCS drain down.

Reactivity Control

The inspectors reviewed AmerenUE's outage reactivity controls to verify that the TS reactivity control requirements were met. The inspectors performed auxiliary building and control room walkdowns on September 17 and 19 to verify that AmerenUE maintained the required boron injection flow paths. The inspectors also reviewed outage activities that could cause unexpected reactivity changes.

Refueling Activities

The inspectors observed fuel handing activities from the reactor building and control room on September 24 and 26, 2005, to verify that operations were performed in

accordance with the FSAR, plant TSs, and fuel handling procedures. The inspectors observed fuel handing coordination from the control room to verify that AmerenUE tracked the location of fuel assemblies during core offload.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed and/or reviewed seven risk significant surveillance tests to verify that AmerenUE adequately demonstrated component safety functions and to assess operational readiness (seven inspection samples). The inspectors verified that testing procedures were properly reviewed and approved with appropriately incorporated acceptance criteria. The inspectors used information in the TSs, the FSAR, Section XI of the American Society of Mechanical Engineers Code, and licensee procedural requirements as the bases for acceptability of sampled surveillance tests. The samples included the following surveillance tests:

- Surveillance 05510445, Containment cooler Train B flow test performed on July 13, 2005. The inspectors completed an in-office review of the completed surveillance test package.

- Surveillance 05508639, Emergency exhaust system test on July 20, 2005. The inspectors completed an in-office review of the completed surveillance test package.

- Surveillance 05510817, Containment isolation verification performed on July 21, 2005. The inspectors observed a portion of the test from the control room and completed an in-office review of the completed surveillance test package.

- Surveillance 05508797/500, RHR Train A inservice test performed on July 26, 2005. The inspectors observed AmerenUE's brief, equipment line-up, and field performance of the test and completed an in-office review of the completed surveillance test package.

- Surveillance 05509057, Component cooling Train B inservice test performed on August 3, 2005. The inspectors observed a portion of the test from the control room and completed an in-office review of the completed surveillance test package.

- Surveillance 05512469, TDAFP inservice test performed on August 29, 2005. The inspectors completed an in-office review and observed a portion of the test from the auxiliary building and control room.

- Surveillance 05502140, Train A RHR valve inservice test performed on September 15, 2005. The inspectors observed the test from the control room and performed and in-office review of the completed surveillance test package.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed one emergency drill during the inspection period (one inspection sample). The inspectors observed AmerenUE's response to a simulated steam generator tube rupture accident without onsite power on August 10. The inspectors observed the drill to evaluate the adequacy of AmerenUE's emergency response and to verify that AmerenUE implemented proper emergency action level classification and protective action recommendations. The inspectors observed the exercise from the Technical Support Center. The inspectors compared drill observations against Emergency Plan Implementing Procedure EIP-ZZ-00101, "Classification of Events," and Emergency Plan Implementing Procedure EIP-ZZ-00201, "Notifications," to evaluate licensee performance.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Daily Reviews

a. Inspection Scope

The inspectors performed a daily review of items entered into AmerenUE's corrective action program. The inspectors performed this screening to identify any repetitive equipment failures or adverse human performance trends for followup. The inspectors also attended selected conditions adverse to quality report screenings and daily plant status meetings.

b. Findings

No findings of significance were identified

.2 Annual Sample Review

Routine Review of Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed detailed in-office reviews and walkdowns of plant equipment related to three significant conditions adverse to quality (three inspection samples). The inspectors reviewed AmerenUE's CAR reports to verify that the full extent of the issues was identified, that AmerenUE performed appropriate evaluations, and that adequate corrective actions were specified and prioritized. The inspectors evaluated the reports against the requirements of Administrative Procedure APA-ZZ-00500, "Corrective Action Program," and 10 CFR Part 50, Appendix B. The inspectors reviewed the following two samples:

- CAR 200505224, Control building ventilation boundary degraded due to failed door latch
- CAR 200504163, Unexpected main steam feedwater isolation signal logic Cabinet SA075B channel failure
- CAR 200505194, Containment recirculation sump suction valves

b. Findings

Ineffective Corrective Actions for Control Building Habitability Boundary Maintenance

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, "Corrective Action," after ineffective corrective actions resulted in a repeat degradation of the control building emergency ventilation habitability boundary.

Description. AmerenUE's corrective actions to prevent a repeat failure of the control building emergency ventilation habitability boundary were ineffective. Technical Specification 3.7.10, "Control Room Emergency Ventilation System," established the requirement for maintaining the habitability boundary. Door DSK33021, located between the essential switchgear and emergency diesel generator rooms, functions as a control building pressure and switchgear room Halon boundary. On July 25, 2005, AmerenUE identified that the door latching mechanism was bent and a corrective maintenance request was initiated. A plant operator identified that the door latch had failed on July 27, 2005, resulting in the inoperability of a control building ventilation habitability boundary. AmerenUE repaired the door. AmerenUE identified that the work control organization had authorized work on the door without approval of the operations department. As a result, operations did not understand that the habitability boundary had been compromised by the maintenance and that TS Limiting Condition for Operations 3.7.10 should have been applied. A plant operator identified that the door latch had been removed for maintenance on July 29, 2005. The work control

organization had again authorized work on the door without approval of the operations department. As a result, operations was not informed that the habitability boundary had been compromised by the maintenance. AmerenUE's corrective actions following the failure of maintenance to gain approval by the operations department, following the July 27, 2005, event, failed to prevent reoccurrence of a similar event on July 29, 2005. This finding is related to less than adequate corrective action and is associated with the crosscutting area of problem identification and resolution.

AmerenUE's operability evaluation of the degraded door was less than adequate. AmerenUE concluded the control building emergency ventilation habitability boundary was operable because the unlatched door was kept in the closed position by the higher pressure in the diesel generator building. However, the operability evaluation did not consider that the control room emergency pressurization fan would pressurize the other side of the door at least 1/8 inch of water during accident conditions. AmerenUE did not consider that the diesel generator air inlet was located next to the door, which would cause a lower pressure on the other side of the door when the diesel generator was operating. Additionally, the diesel room supply fan is designed to turn off when the room temperature decreases to less than 85 degrees.

Analysis. AmerenUE's failure to implement effective corrective actions to ensure plant configuration was consistent with accident analysis assumptions was a performance deficiency. This finding was greater than minor because it was associated with the integrity of the control building pressure envelope. Because this finding involved the degradation of barrier integrity, the finding was evaluated using the significance determination process for at-power situations. The inspectors concluded that the finding was only of very low safety significance because the finding only represented a degradation of the radiological barrier function provided for the control room. A crosscutting aspect associated with problem identification and resolution was identified for the failure to prevent a repeat degradation of the ventilation system boundary.

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XVI, "Corrective Action," required that measures be established to assure that conditions adverse to quality are promptly identified and corrected. For significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action is taken to preclude repetition. Contrary to the above, AmerenUE's corrective actions failed to preclude recurrence of degraded control building habitability barriers. Because of the very low safety significance and AmerenUE's action to place this issue in their corrective action program (CARs 200505224 and 200505279), this violation is being treated as an NCV in accordance with Section VI.A.1 of the Enforcement Policy (0500483/2005-05).

4OA4 Crosscutting Aspects of Findings (71152)

Section 1R14 documents one finding with human performance crosscutting aspects associated with failure of an operator to follow a procedure which resulted in the loss of configuration control of the cold overpressure mitigation system configuration while the reactor was in Mode 5 (AV 05000483/2005004-01).

Section 1R15 documents one finding with human performance crosscutting aspects associated with failure of an operator to follow a procedure which resulted in the misalignment of the TDAFP mechanical overspeed trip mechanism (NCV 05000483/2005004-02).

4OA6 Management Meetings

Exit Meeting Summary

On August 15, 2005, the inspectors presented the results of the follow up to Temporary Inspection 2515/163, Operational Readiness of Offsite Power, to Mr. T. Herrman, Manager, Engineering, and other members of his staff who acknowledged the findings.

The inspectors presented the preliminary inspection results to Mr. A. Heflin, Site Vice President, and other members of licensee management at the conclusion of onsite portion the Heat Sink Performance biennial inspection on July 1, 2005. The inspectors presented the final inspection results to Mr. M. Reidmeyer, Supervisor, Regulatory Affairs, on August 5, 2005. No proprietary information was reviewed.

On September 26, 2005, the resident inspectors presented their inspection results to Mr. C. Naslund, Senior Vice President and Chief Nuclear Officer, and other members of his staff who acknowledged the findings.

The inspectors verified that no proprietary information was reviewed during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

A. Heflin, Site Vice President
T. Herman, Supervisor, Design Engineering
M. Reidmeyer, Supervisor, Regional Regulatory Affairs
T. Sharkey, Superintendent, Engineering Technical Support
L. Thibault, General Plant Manager

LIST OF ITEMS OPENED AND CLOSED

Opened

05000483/2005004-03	URI	Potential Failure of the RHR Containment Suction Valves During Certain Design Bases Events (Section 1R15)

Opened and Closed

05000483/2005004-01	AV	Failure to Maintain Cold Overpressure Mitigation Measures as Required by TSs (Section 1R14)
05000483/2005004-02	NCV	Misalignment of the TDAFP due to Personnel Error (Section 1R15)
05000483/2005004-04	NCV	Ineffective Corrective Actions for Door 33021 Failures (Section 4OA2)

DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

OSP-BB-00003, PORV/RHR COMS Alignment Verification, Revision 10

OSP-BG-00002, Verify One Centrifugal Charging Pump Incapable of Injection into RCS, Revision 13

OTN-EJ-00001, Residual Heat Removal System, Revision 20

OTS-EJ-0004A, RHR Pump A Non-Surveillance Run, Revision 2

Miscellaneous

RHR Train A Inservice Test, Revision 34
UFSAR Section 6.3, Emergency Core Cooling System
Drawing M-22EJ01, Residual Heat Removal System, Revision 54

Section 1R05: Fire Protection

Procedures

EIP-ZZ-00226, Fire Response Procedure for Callaway Plant, Revision 11
APA-ZZ-00743, Fire Team Organization and Duties, Revision 18

Section 1R07: Heat Sink Performance

Procedures

CDP-ZZ-00200, Appendix D, Closed Cooling Systems Tables, Revsion 1
CDP-ZZ-00940, Auxiliary Water Systems Chemistry Optimization Plan, Revision 4
CDP-ZZ-00950, Raw Water Systems Control Program, Revision 4
CTP-ZZ-06000, Circ and Service Water Chemical Additions, Revision 47
EDP-ZZ-01112, Heat Exchanger Predictive Performance Manual, Revision 8
EDP-ZZ-01121, Raw Water Systems Predictive Performance Manual,"Revision 7
ETP-GL-00001, Area Room Cooler Test, Revision 4
ETP-EF-0002B, Essential Service Water Train B Flow Verification, Revision 9
ETP-EF-0002A, Essential Service Water Train A Flow Verification, Revision 8
ETP-EG-00001, Component Cooling Water Heat Exchanger Test, Revision 5
ETP-ZZ-03001, GL 89-13 Heat Exchanger Inspection, Revision 5
MPM-ZZ-QQ001, Room Cooler Inspection, Revision 12
OSP-EF-P001B, ESW Train B Inservice Test, Revision 41
OSP-EF-V001B, ESW Train B Valve Operability, Revision 29
OSP-ZZ-00001, Control Room Shift and Daily Log Readings/Channel Checks, Revision 45
OTS-EF-P001B, Performance Testing of Essential Service Water Pump B, Revision 0

Specifications

10466-M-072(Q), Design Specification for Component Cooling Water Heat Exchangers for the Standardized Nuclear Unit Power Plant System (SNUPPS), Revision 11

072-00024, Instruction Manual for Component Cooling Water Heat Exchangers for the SNUPPS Project, Revision 6

Callaway Action Requests

200304241	200308548	200403567	200403664	200407327
200304595	200401550	200403590	200404441	
200308377				

Requests for Resolution

07809C	19513	22364A

Calculations

EF-45, Four Containment Coolers with New Coils, Revision 5

EF-49, Ultimate Heat Sink Thermal Transient Analysis, Revision 0, Addendum 1

EG-20, Max Component Cooling Water (CCW) Temperature During Post - LOCA, Revision 0, Addendum 1

EG-42, Calculate the Number of CCW Tubes That Can Be Plugged, Revision 0

GN-03, Determine the Minimum ESW Flow Rate to GN Coolers with New Coils, Revision 5, Addendum 3

KJ-10, Determine Tube Plugging Limits For DG Intercooler Heat Exchangers, EKJ03A/B, DG Jacket Water Heat Exchangers, EKJ06A/B, and the Lube Oil Coolers, EKJ04A/B, Revision 0

EF-049, UHS Thermal Transient Analysis, Revision 0

EF-049, UHS Thermal Transient Analysis, Revision 0, Addendum 1

EF-52, Heat Exchanger Performance Based on Reduced ESW Temperature and Flow, Revision 1

NESE-1081, Aeorfin Containment Cooler Performance Data Assuming 33EF or 95EF ESW Water Temperature, Addendum 1

Maintenance Orders

P676141	P701990	P718659
P676150	P701992	W236012

Miscellaneous

Inservice Test Data for ESW Train B Pump and Valves from June 2002 through June 2005

Report PD04594.03, Record of Eddy Current Inspection of CCW Heat Exchanger A, April 2004

Report PR 17-17, Emergency Diesel Generator B - Heat Exchangers, dated September 2002

Final Safety Analysis Report, Section 9.2.1.2, Essential Service Water System

Report UOTCR 03-018, Cycle 12 Raw Water Report, dated March 27, 2003

Report UOTCR 05-006, Cycle 13 Raw Water Report, dated February 9, 2005

Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment, dated July 18, 1989

Generic Letter 89-13, Supplement 1, Service Water System Problems Affecting Safety-Related Equipment, dated April 4, 1990

Letter ULNRC-2146, Response to Generic Letter 89-13 - Service Water System Problems Affecting Safety-Related Equipment, dated January 29, 1990

PROTO-HX, Version 4.10, Shell and Tube Heat Exchangers User Documentation

NUPIC Audit 19290, Audit of Proto Power Corporation, dated June 22, 2005

Essential Service Water - EF - Lesson Plan

Figure B.3.6.6-1, Containment Cooler Heat Removal Minimum Cooling Flow Rate

Heat Exchanger Specification Sheets for EKJ03A/B, EKJ04A/B, EKJ06A/B, SGN01A/B/C/D, SGL15A/B, and EEG01A/B

Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation

Procedures

EDP-ZZ-01128, Maintenance Rule Program, Revision 6

EDP-ZZ-01129, Callaway Plant Risk Assessment, Revision 8

ODP-ZZ-00001, Operations Department - Code of Conduct, Revision 23

Other

Nuclear Management and Resource Council 93-01, “Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 3

Section 1R20: Refueling and Outage Activities

Procedures

APA-ZZ-00150, Outage Preparation and Execution, Revisions 16 and 17

APA-ZZ-00500, Corrective Action Program, Revision 38

EDP-ZZ-01129, Callaway Plant Risk Assessment, Revision 8

MOA-SM-00001, Containment Equipment Hatch Operation for Temporary Opening and Closing, Revision 0

ODP-ZZ-00002, Equipment Status Control, Revision 28

OTO-ZZ-00012, Severe Weather, Revision 3

Miscellaneous

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

FSAR Section 3.5, Missile Protection

FSAR Section 9.5, Other Auxiliary System

FSAR Section 16.7.11, Area 5 Missile Shields

Section 1R22: Surveillance Testing

Procedures

OTN-EJ-00001, Residual Heat Removal System, Revision 20
OSP-EG-P01BD, CCW Train B Pump and Valve Inservice Test, Revision 19
OSP-EJ-P001A, RHR Train A Inservice Test, Revision 39
OSP-GP-00001, Containment Isolation Verification, Revision 14
OTS-EJ-0004A, RHR Pump A Non-Surveillance Run, Revision 2

Miscellaneous

RHR Train A Inservice Test, Revision 34

UFSAR Section 6.3, Emergency Core Cooling System

Drawing M-22EJ01, Residual Heat Removal System, Revision 54

TSs, the FSAR, Section XI of the American Society of Mechanical Engineers Code, and licensee procedural requirements as the bases for acceptability

Section 4OA2: Identification and Resolution of Problems

Quality Assurance Audits and Surveillance Reports

AP05-004, Audit of testing, May 6, 2005

AP05-005, Chemistry program audit, June 27, 2005

AP05-006, Personnel qualifications and training audit, July 8, 2005

AP05-008, Quality Assurance Independent Audit of the Operating Quality Assurance Program

AP05-009, Quality Assurance audit of emergency preparedness, September 6, 2005

AUCA 05-017, Underground electrical line hit during concrete demolition, June 1, 2005

SEGR 05-06-009, Independent technical review report, June 29, 2005

SP05-006, Worker practices, June 8, 2005

SP05-025, Readiness assessment for Refuel 14 for supplemental personnel, September 13, 2005

SP05-033, Surveillance of the method of identifying procedures affected by Refuel 14 modifications, September 15, 2005

CAR 200504855, Audit of Internal Audit Program Findings

CAR 200504856, QME Audit of ITR-ORC Programs - Recommendations

APA-ZZ-00500, Corrective Action Program, Revision 38

LIST OF ACRONYMS

CAR	Callaway Action Request
CCW	component cooling water
ESW	Essential Service Water
FSAR	Final Safety Analysis Report
MSIV	main steam isolation valve
OE	operating experience
RCS	reactor coolant system
RHR	residual heat removal
TDAFP	turbine-driven auxiliary feedwater pump
TS	Technical Specification