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

November 5, 2004

Garry L. Randolph, Senior Vice
President and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2004004

Dear Mr. Randolph:

On September 23, 2004, the NRC completed an inspection at your Callaway Plant. The enclosed report documents the inspection findings which were discussed on September 24, 2004, with Mr. W. Witt, Plant Manager, 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 NRC-identified findings that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also 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. These NCVs are described in the subject inspection report. If you contest the violation 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 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/

David N. Graves, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

Enclosure:
NRC Inspection Report
05000483/2004004
w/attachment: Supplemental Information

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-483
License:	NPF-30
Report:	05000483/2004004
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, Missouri
Dates:	June 24 through September 23, 2004
Inspectors:	M. S. Peck, Senior Resident Inspector J. D. Hanna, Resident Inspector D. E. Dumbacher, Resident Inspector W. Sifre, Reactor Inspector W. McNeill, Reactor Inspector
Approved By:	D. N. Graves, Chief, Project Branch B

SUMMARY OF FINDINGS

IR 05000483/2004004; 06/24 - 06/23/2004; Callaway Plant. Personnel Performance During Nonroutine Plant Evolutions, Operability Evaluations and Postmaintenance Testing.

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

Inspector-Identified and Self-Revealing Findings

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a noncited violation of 10 CFR 50.54(q), 10 CFR 50.47(b)(4), and Section IV.B of Appendix E of 10 CFR Part 50, which involved the failure to correctly classify an Unusual Event in accordance with the emergency plan and implementing procedures. The operations crew did not activate the emergency plan for a fire in the protected area, adjacent to the control building, which lasted longer than 15 minutes from verification. This finding has human performance crosscutting aspects in that the licensee failed to properly apply event evaluation criteria.

  This finding is more than minor because it affected the response organization performance attribute of the emergency preparedness cornerstone due to failure to properly recognize plant conditions commensurate with an Unusual Event classification. This finding was of very low safety significance, because it did not meet any higher level emergency plan and implementing procedure notification requirements. The licensee placed the issue into the corrective action program as Callaway Action Request 200407284 (Section 1R14).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, after the licensee failed to perform an adequate selection and suitability review prior to installing 132 lead radiation shield blankets in containment. The licensee did not address the effect that blankets may have on safety-related equipment during accident conditions. During an accident, some of the blanket coverings/coatings may deteriorate into foreign material and be transported to the containment sump. Once at the sump, this foreign material may challenge emergency core cooling system recirculation function by reducing the available net positive suction head to the residual heat removal and containment spray pumps.

  The finding is greater than minor because it affected the cornerstone objective to ensure availability and reliability of the containment sump. 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, fire, flooding, or severe weather initiating event. The licensee placed this issue in their corrective action program as Callaway Action Request 200404836 (Section 1R15).

REPORT DETAILS

Summary of Plant Status: Union Electric operated the Callaway Plant at full power for the duration of the inspection period.

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

1R04 Equipment Alignment Partial System Walkdowns (71111.04)

a. Inspection Scope

The inspectors completed four partial system walkdowns during the inspection period. The inspectors performed the walkdowns to verify component alignment and subsystem operability. The inspectors used the applicable Final Safety Analysis Report (FSAR) and Technical Specifications (TSs) sections and the procedures and drawings listed in the attachment, as a bases for acceptability. The inspectors walked down:

- Auxiliary feedwater (AFW) system Train A while the redundant train was out of service for routine scheduled maintenance. The inspectors walked down components located in the auxiliary and control buildings on June 7.

- Fuel pool cooling and cleanup system Train B while the redundant train was out of service for preventive maintenance. The inspectors walked down components located in the fuel and control buildings on August 16.

- Control room emergency ventilation and air conditioning system Train B while the redundant train was out of service for corrective maintenance. The inspectors walked down components located in the auxiliary and control buildings on August 24.

- Essential service water (ESW) system Train B while the redundant train was out of service for preventive maintenance. The inspectors walked down ESW components located in the control, diesel generator, and auxiliary buildings, the ESW pumphouse, and ultimate heat sink cooling tower on September 21.

b. Findings

No findings of significance were identified.

1R05 Fire Protection Routine Fire Protection Walkdowns (71111.05)

a. Inspection Scope

The inspectors performed eight walkdowns of the accessible portions of the fire areas described below. These walkdowns were performed to assess the licensee's control of transient combustible materials, ignition sources, fire detection and suppression capabilities, fire barriers, and related compensatory measures. The inspectors also

reviewed commitments described in the FSAR, Section 9.5.1, "Fire Protection System," and Appendix 9.5B, "Fire Hazard Analysis," to determine requirements for fire protection design features, fire area boundaries, and combustible loading requirements for each fire area. The inspectors walked down:

- Fire Areas C-32, C-33, and C-34, cable spreading rooms, and chases on the 2073 foot elevation on July 1
- Fire Areas C-13 and C-14 and Class 1E air conditioning Rooms 3415 and 3416 on July 7
- Fire Area A-20, Personnel hatch and component cooling water (CCW) surge tank rooms on July 21
- Fire Area C-1, Pipe space and tank area control building, Room 3101 on July 21
- Fire Areas A-13, A-14, and A-15, and AFW pump Rooms 1325, 1326, and 1331 on August 4
- Fire Area A-2, Safety-related pump area on August 4
- Fire Area D-1, Diesel generator Room 5203 on September 8
- Fire Area D-2, Diesel generator Room 5201 on September 8

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors completed two flood protection walkdowns during the inspection period. The inspectors walked down both ESW pump houses on July 4 to review plant configuration for susceptibility to external flooding, such as that caused by heavy rains or flash flooding. The inspectors also walked down the control building 1974 foot elevation (Room 3101) and the auxiliary building 1974 foot elevation, on July 21, to review the area for susceptibility to internal flooding, such as that which may be caused by pipe breaks. The inspectors conducted the walkdowns to verify that the licensee had implemented adequate protection for equipment below the postulated floodline, including electrical conduits, holes, and wall penetrations. The inspection included common drains, sumps, sump pumps, level alarms, and control circuits. The inspectors also reviewed Quality Assurance Surveillance Report SP04-039, "Assess the Adequacy of ESW Examinations in Refuel 13," June 29; Callaway Action Request (CAR) 200200566, "Groundwater leakage into the 1974 foot elevation of the

control building;" and Work Request W220622, "Repair of groundwater leaks in Room 3101." The inspectors used FSAR Section 3.6, "Protection Against the Dynamic Effects Associated with the Postulated Rupture of Piping;" and Flood Analysis Calculation M-FL-01, "Flood of the Auxiliary Building," Revision 2, as a basis for acceptability of the observed plant configuration.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (71111.08)

a. Inspection Scope

Reactor Pressure Vessel Bottom Mounted Instrument Nozzle Inspection

The inspectors had previously reviewed the procedures, analysis guidelines, and personnel qualifications for the inspection of the bottom-mounted instrument nozzles in the reactor pressure vessel bottom. The inspectors subsequently reviewed the test data for eight of the 58 bottom-mounted instrument nozzles. The inspectors discussed the inspection results with the primary analyst and determined that the inspections were performed in accordance with the prescribed procedures and no anomalies were identified. This completes the requirements of Temporary Instruction 2515/152, "Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02)."

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 sample of licensed operator simulator requalification examinations. The inspectors observed the examination to assess operator performance during high-risk operator actions associated with the emergency plan, lessons-learned items, and plant operational experiences. The inspectors observed Dynamic Simulator Scenario Exams DS-10 and DS-11 on August 12.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q)

a. Inspection Scope

The inspectors reviewed three samples of equipment maintenance problems. The inspectors performed the review to verify that the licensee's maintenance efforts met 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:

- CAR 200401869, Emergency diesel generator (EDG) Train A failed to start during surveillance testing
- CAR 200401986, EDG Train B water pump failed
- CAR 200402529, EDG Train B inoperable due to failed light socket

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed six maintenance risk assessments. The inspectors compared the licensee's risk assessment and risk management activities 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," Revision 6. The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from degraded equipment. The inspectors evaluated the following risk assessments:

- Contingencies for the inoperability of EDG Train B on July 8. The inspectors observed the licensee's implementation of risk mitigating contingencies from the control room and switchyard and reviewed CAR 200405603, contingency action implementation improvement opportunity.

- Surveillance S727533, turbine-driven auxiliary feedwater (TDAFW) pump inoperable for testing on August 2. The inspectors performed an in-office review of the licensee's risk assessment and reviewed CAR 200406180, TDAFW pump casing steam leak.

- Unplanned inoperability of the TDAFW pump between August 4 and 6. The inspectors observed the licensee's implementation of risk contingencies from the control room on August 5 and 6.

- Surveillance S727772, CCW Train B flow and surge tank level instrument calibration. The inspectors observed the licensee's implementation of risk mitigating contingencies from the control room on August 10.

- Surveillance S708436, calibration of the wide-range reactor coolant loop temperature element. The inspectors reviewed the licensee's risk assessment and observed contingencies from the control room on August 17.

- Preventive maintenance outage of ESW and EDG Train A on September 21. The inspectors observed the licensee's implementation of risk mitigating contingencies from the control building and EDG Train B room on September 21.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions (71111.14)

a. Inspection Scope

The inspectors reviewed one nonroutine plant event for personnel performance. The inspectors reviewed operator response following events which required more than routine expected operator actions or involved operator errors. The inspectors reviewed the licensee's actions following a communication corridor and control building elevator equipment room fire on September 18. The inspectors attended the licensee's postevent critique on September 20 and completed an in-office review of CAR 200407284, which was written to address the event.

b. Findings

Introduction. An NRC identified Green noncited violation (NCV) of 10 CFR 50.54(q), 10 CFR 50.47(b)(4), and Section IV.B of Appendix E of 10 CFR Part 50 was identified after the licensee failed to declare an Unusual Event (UE) after a protected area fire was not extinguished within 15 minutes of verification.

Description. A fire occurred on the communication corridor roof on September 18. The fire started after a welder ignited weather sealant material on the roof. The welding

firewatch extinguished the flames, which were visible from the rooftop. There was no firewatch in the control building elevator equipment room below. At 5:35 p.m., the control room received a smoke alarm from the communication corridor and verbal notification of smoke present in the hallway outside the control room door (2047 foot elevation). Also, the supervisor involved with the welding notified the control room that a small fire had occurred on the roof above the elevator and that the fire was extinguished. Approximately 4 minutes later, the control room received additional smoke alarms from the communication corridor lobby (2000 foot elevation). The operations shift supervisor investigated the alarms. At 5:43 p.m., the shift supervisor identified a fire in the control building elevator equipment room and activated the plant fire brigade. At 5:54 p.m., the fire brigade extinguished the fire and at 6:15 p.m. they secured from the fire. No re-flash watch was established. At 7:10 p.m., an equipment operator returned to the control building equipment room and identified that the fire had re-flashed. The shift supervisor reactivated the fire brigade. At 7:19 p.m., the fire brigade declared the second fire to be extinguished.

Emergency Plan Implementing Procedure EIP-ZZ-0101, "Classification of Emergencies," Emergency Action Level 3E, Revision 32, "Fire Within the Protected Area Boundary not Extinguished within 15 minutes of Verification," required the licensee to declare a UE if a fire located adjacent to the control building was not extinguished within 15 minutes of verification. The first fire had a duration of 19 minutes between the time that the control room received verification of the alarm at 5:35 p.m. from the person on the roof of the control building and the time that the fire was extinguished in the control building elevator equipment room at 5:54 p.m. The bases for Emergency Action Level 3E provided an exclusion for small fires, such as a waste-basket fire, from the UE declaration. However, this fire resulted in alarms on multiple plant elevations and required two activations of the fire brigade to suppress it.

Analysis. The inspectors determined that the failure to implement an emergency classification and emergency action level was a performance deficiency. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function and was not the result of any willful violation of NRC requirements or licensee procedures. The finding was more than minor because it was associated with the emergency response organization performance attribute of the emergency preparedness cornerstone and affected the cornerstone objective of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors determined the finding was associated with an actual event implementation problem, and its significance was assessed using Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process." Using the emergency preparedness significance determination process Sheet 2, "Actual Event Implementation Problem," the inspectors determined the finding was of very low safety significance (Green) because the licensee failed to implement a risk significant planning standard (10 CFR 50.47(b)(4)) during an actual UE. This finding, which involved operator failure to implement a procedure, was associated with the crosscutting area of human performance.

Enforcement. In part, 10 CFR 50.54(q), 50.47(b)(4), and Section IV.B of Appendix E of 10 CFR Part 50 require that an emergency action declaration be made promptly after an emergency action level is met. Contrary to the above, the licensee failed to classify and declare a UE on September 18 when all required conditions necessitating classification and declaration of a UE were met. This violation is being treated as a NCV in accordance with Section VI.A.1 of the Enforcement Policy issued May 1, 2000 (65 FR 25388). This violation is identified as NCV 05000483/2004004-01, failure to classify and declare notification of a UE as required by 10 CFR 50.54(q), 50.47(b)(4), and Section IV.B of Appendix E of 10 CFR Part 50. The licensee placed the issue into the corrective action program as CAR 200407284.

1R15 Operability Evaluations (OEs) (71111.15)

a. Inspection Scope

The inspectors reviewed six operability determinations to verify that the licensee properly evaluated the operability of plant components and systems. The inspectors compared the technical adequacy of the evaluations to requirements stated in the TSs, the FSAR, and associated design-bases documents.

- OE 200406231, operability of the TDAFW pump following loss of oil to the inboard turbine bearing on August 6. The inspectors observed turbine troubleshooting activities associated with the TDAFW pump in the auxiliary building and mechanical maintenance shop. The inspectors also completed an in-office review of "Callaway TDAFW Pump Terry Turbine Drive Coupling End Bearing Assessment," AREVA FANP, August 31, 2004; Calculation BO-04, "Condensate Storage Tank Auxiliary Feedwater Inventory for Station Blackout," Revision 1; and Calculation ZZ-521, "Required TDAFW Pump Mission Time," Revision 0.

- OE 200404269, degradation of NK14 125 Vdc Battery Cell 47. The inspectors performed an inspection of the battery on July 7 and completed an in-office review of the OE.

- OE 200407239, seal damage on the condensate storage tank floating cover. The inspectors performed a walkdown of the degraded condensate storage tank on September 18 and completed an in-office review of the OE.

- OE 200308667, accident analysis operator response times may not be met following a main steamline break. The inspectors walked down the compensatory actions in the control room on September 18 and completed an in-office review of the OE.

- OE 200407285, pinhole leak in ESW piping at the CCW heat exchanger. The inspectors walked down the affected equipment located in the auxiliary building on September 21 and completed an in-office review of the OE.

- OE 200404836, containment recirculation sump blockage evaluation. The inspectors completed an in-office review of "Evaluation of the Impact of Systems at the Callaway Plant Resulting from Installation of Lead Blankets Inside Containment," Westinghouse Electric Company, August 24; and "Nuclear Environmental Qualification Test Report of Various Lead Blankets," Wyle Laboratories, August 3.

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, after the licensee failed to perform an adequate selection and suitability review prior to installing 132 lead radiation shield blankets in the containment building. The licensee did not address the effect of a failure of the blankets during accident conditions on the containment recirculation sump function.

Description. The inspectors identified 132 lead radiation shield blankets in containment during the closeout inspection at the end of Refueling Outage 13 (documented as Unresolved Item (URI) 05000483/2004003-02, in NRC Inspection Report 05000483/2004003). The blankets were placed within the bioshield and in close proximity to high energy reactor coolant system piping. These blankets were covered/coated with a double layer of 0.027-inch thick Herculite fabric with a vinyl laminate. During an accident, some of the blanket coverings/coatings may deteriorate into foreign material. Some of this foreign material would be expected to fall to the containment floor and be transported to the containment sump by the flow from the reactor coolant system pipe break. Once at the sump, this foreign material may challenge the emergency core cooling system recirculation function by reducing the available net positive suction head to the residual heat removal and containment spray pumps. The blankets contained a total of 3,876 square feet of the vinyl laminate fabric. The licensee installed 20 blankets in 1987 (Modification 86-0037A), 20 blankets in 1993 (Modification 92-1025), 74 blankets in 2000 (Modification 99-1003), and 18 blankets in 2004 (Modification 01-1026-2). The licensee removed all of the lead blankets from containment prior to restarting the reactor at the conclusion of Refueling Outage 13.

The plant licensing bases included a commitment to Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a LOCA," Revision 0, June 1974. This regulatory guide allowed the licensee to assume that 50 percent of the sump area would be unavailable due to debris. However, the 50 percent sump blockage assumption did not provide for the addition of nonqualified coverings/coatings and other foreign material to be placed in containment without an appropriate safety analysis. The licensee did not adequately address the potential for the loss of postaccident recirculation sump function in any of the modification design packages controlling the installation of the shield blankets.

The licensee completed an OE (200404836) of the recirculation sump function during the current inspection period. The licensee concluded that the containment sump would

remain functional during an accident with the blankets installed. The OE was based on environmental testing of a representative sample of the blankets being exposed to a simulated postaccident environment. From this testing, the licensee determined the blanket failure mechanisms and the type of debris formed. This data was used to estimate how much of the blanket covering/coating debris may be transported to the containment sumps during a loss of coolant accident.

Analysis. The inspectors used the at-power situations significance determination processes to analyze the finding. This finding affected the mitigation systems cornerstone because of its effect on the emergency core cooling safety function. This finding was greater than minor because it affected the cornerstone objective to ensure availability and reliability of the containment sump and the design control attribute associated with plant modifications. This finding was 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, fire, flooding, or severe weather initiating event.

Enforcement. Appendix B, Criterion III, of 10 CFR Part 50, Design Control, required that measures be established for the selection and review for suitability of application of materials that are essential to the safety-related functions of the structures, systems, and components. Contrary to this requirement, the licensee did not establish adequate measures for the selection and review for suitability before the installation of 132 lead blankets in containment. Specifically, the licensee failed to ensure these materials would not adversely affect the function of the safety-related containment sump during an accident. Because of the very low safety significance and the licensee's action to place this issue in their corrective action program as CAR 200404836, this violation is being treated as an NCV in accordance with Section VI.A.1 of the Enforcement Policy (NCV 05000483/2004004-02).

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors completed an evaluation of one operator workaround during the inspection. The inspectors reviewed the effect of the inoperability of containment Level Indicator EJL00008 on the licensee's ability to implement the emergency operating procedures. During the review, the inspectors considered whether the functional capability of the system or human reliability in responding to an initiating event was adversely affected. The inspectors also attended the July 7 and August 10 operator workaround management meetings. The inspectors completed the review on August 20.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed five postmaintenance tests (PMTs) that could potentially affect risk-significant systems or components. The inspectors performed an in-office review and plant observation to verify that each test adequately demonstrated system operability and capability. The inspectors used plant TSs, the FSAR, and American Society of Mechanical Engineers Code Section XI to determine system and component requirements and PMT acceptability. The inspectors' review included the following PMTs:

- PMTs R723309A, R728545A, and R728545C, repair of the TDAFW pump following turbine lube oil system, turbine alignment, and speed sensor adjustments, performed on August 6. The inspectors completed an in-office review of the completed test package.

- PMTs R211884A, R23089A, and R21186A following replacement of EDG Train A cylinder plug's o-rings, the Number 13 banjo housing and the Number 5 pushrod tube oil rings on August 11. The inspectors completed an in-office review of the PMTs.

- PMTs R705477A and R70648A, control room emergency filtration fan and safety related air conditioning unit following preventive maintenance on September 7 and 8. The inspectors completed an in-office review of the PMTs.

- PMTs R611297A, R704974A, and R704974B following maintenance on the Limitorque motor-operated valve operators for AFW Valves ALHV00310 and ALHV00311 on August 11. The inspectors completed an in-office review of the PMTs.

- PMT R570993B, containment personnel access hatch preventive maintenance on July 9 and CAR 200405610, failed containment hatch barrel leak-rate test. The inspectors completed an in-office review of the PMT and performed followup interviews with maintenance personnel.

b. Findings

Introduction. The inspectors identified an issue where a PMT failed to identify degraded TDAFW pump turbine bearing cooling following a turbine overhaul. This issue is unresolved pending further inspection of the licensee's bearing evaluation and completion of the significance determination process.

Description. On June 9, the licensee completed a TDAFW pump PMT following a turbine overhaul. On August 3, the licensee identified an elevated TDAFW pump inboard turbine bearing temperature during a routine surveillance test. The licensee disassembled and inspected the turbine lube oil system. The licensee identified that the orifice supplying cooled lube oil to the inboard bearing was partially obstructed by ferrous debris. Inspection of the turbine lubricating oil revealed significant ferrous particulate contamination. The licensee determined that the lube oil filter had been improperly installed during the overhaul and allowed oil flow to bypass the filter cartridge. The debris originated from corrosion inside the lube oil system instrument branch. The direct cause of the elevated bearing temperature was the introduction and buildup of particulate material over an extended period of time, coupled with ineffective fluid filtration.

The licensee's PMT program, as described in Procedure PDP-ZZ-00001, Revision 5, stated that testing should be conducted under conditions representative of normal operating parameters, including temperature. The licensee only operated the turbine for 25 minutes during the PMT on June 9. Twenty-five minutes was not an adequate duration for the turbine to reach thermal equilibrium conditions. Corrective action following a previous turbine failure (CAR 200208352, Action 34) stated that turbine PMTs should have a 4-hour duration following governor valve maintenance. This action was to ensure that the governor valve stem would reach thermal equilibrium conditions during the PMT. The turbine overhaul included governor valve maintenance. The previous corrective action to operate the TDAFW pump to reach thermal equilibrium conditions was not implemented during the PMT on June 9.

The inspectors concluded that the licensee had a second opportunity to detect the inboard bearing obstruction during the PMT on June 9. Turbine bearing temperatures normally decrease about 15EF after turbine startup due to lube oil cooling. Plant data indicated that the inboard bearing temperatures increased about 10EF following the turbine startup on June 9. The increased temperature was indicative of degraded bearing cooling. The turbine overhaul had the potential to affect the function of lube oil cooling. However, the licensee did not address turbine bearing temperatures in the PMT acceptance criteria.

The licensee completed OE 200406231 of the TDAFW pump with degraded turbine bearing cooling. The licensee concluded that the turbine would function for at least 4 hours before bearing failure due to high temperatures. The licensee considered the 4-hour station blackout event as the limiting station transient for the TDAFW pump mission. The OE used a heat transfer model to predict bearing temperature as a function of time and a stress analysis to predict the bearing babbitt performance. The OE only credited cooling by oil supplied to the bearing by the slinger ring. The inspectors questioned whether 4 hours was the limiting time for determining satisfactory performance of the TDAFW pump turbine given the range of events that rely upon satisfactory operation of the system. as a result, the licensee was re-evaluating the capability of the turbine bearing to perform a longer mission time. The completed

evaluation will be reviewed to determine whether the turbine bearing would have been able to complete its required safety mission time. This issue was entered into the licensee's corrective action program as CAR 200406231. Pending review of the licensee's evaluation of turbine bearing performance and determination of the finding's safety significance, this finding is identified as URI 05000483/2004004-02, postmaintenance test failure to identify a degraded TDAFW pump turbine bearing cooler.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed and/or reviewed six surveillance tests to assess system operational readiness and to verify that the tests demonstrated system safety function. The inspectors compared the following surveillance tests against requirements in plant TSs, American Society of Mechanical Engineers Code Section XI, the FSAR, and licensee procedural requirements:

- Surveillances S726446, S726447, S726448, and S726449, essential 4 kV degraded and undervoltage calibration. The inspectors observed the tests from the relay room and the essential 4 kV bus room on July 8 and performed an in-office review of the completed test packages.

- Surveillance S727533, TDAFW pump inservice flow test was completed on August 2. The inspectors performed an in-office review of the completed surveillance package.

- Surveillance S727772, CCW Train B flow and surge tank level instrument calibration. The inspectors observed a portion of the test in the control building on August 10 and performed an in-office review of the completed surveillance package.

- Surveillances S728786 and S728781, containment cooler flow and operational test on September 7. The inspectors completed an in-office review of the completed test packages.

- Surveillances S727684 and S728524, EDG Train B monthly test performed on August 11. The inspectors observed a portion of the test from the control and EDG buildings and performed an in-office review of the completed surveillance packages.

- Control Room Habitability Test ETP-GK-0002A, Revision 0. The inspectors observed a portion of the test from the control room and the control building on September 17 and 18. The inspectors completed an in-office review of the collected data.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed two emergency drills during the inspection period. The inspectors observed the exercises to evaluate drill adequacy and to verify that the licensee implemented proper emergency action level classification and protective action recommendations. The inspectors observed the Radiological Emergency Response Plan Team 1 Drill conducted on September 1. The inspectors observed portions of the exercise from the control room simulator, Technical Support Center, and Emergency Operations Facility. The inspectors also observed the Expanded Rapid Responder Proficiency Drill, Cycle 2004-4, conducted on September 22. The inspectors observed portions of the drill from the control room simulator and Technical Support Center. The inspectors compared drill observations against Operations Procedure ODP-ZZ-0025, "EOP Usage," Revision 5; Emergency Plan Implementing Procedure EIP-ZZ-00101, "Classification of Events," Revision 32; and Emergency Plan Implementing Procedure EIP-ZZ-00201, "Notifications," Revision 40, to evaluate licensee performance.

b. Findings

No findings of significance were identified.

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors sampled licensee submittals for the three performance indicators listed below for the period from June 2003 through June 2004. The inspectors used the definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," to verify the accuracy of the performance indicator data reported by the licensee.

Reactor Safety Cornerstone

- Unplanned Scrams per 7000 Critical Hours
- Scrams With Loss of Normal Heat Removal
- Unplanned Transients per 7000 Critical Hours

b. Findings

No findings of significance were identified.

4OA2 Routine Review of Identification and Resolution of Problems (71152)

a. Inspection Scope

The inspectors performed a detailed in-office review of one significant condition adverse to quality related to a negative trend in reactivity control. The inspectors reviewed the June 2004 Reactivity Management Report and CAR reports listed in the attachment to verify that the full extent of the issue was identified, that the licensee performed an appropriate evaluation, and that corrective actions were specified and prioritized. The inspectors evaluated the reports against the requirements of Administrative Procedure APA-ZZ-00500, "Corrective Action Program," Revision 35; and 10 CFR Part 50, Appendix B. The inspectors attended the CAR screening meeting on August 31.

The inspectors also performed a screening review of each item entered into the licensee's corrective action program during the inspection period. This review was accomplished by attending corrective action program review board meetings and by viewing corrective action program documents. The inspectors performed the review to identify conditions, such as repetitive equipment failures or human performance issues, that warrant additional followup. The inspectors also performed the review to verify that equipment, human performance, and program issues were identified by the licensee at an appropriate threshold and are being entered into the problem identification and resolution program.

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153)

1. (Closed) Licensee Event Report (LER) 05000483/2003-007-01: Failure to maintain a control room ventilation boundary resulted in an unanalyzed condition.

On July 17, 2003, the licensee identified that the plant configuration compromised the integrity of the control room envelope. The licensee reported in LER 05000483/2003-007-00 that air entering the control building from normally open pressure boundary Door 32201 resulted in a postulated postaccident control room thyroid dose greater than the dose approved in the accident analysis. In April 2004, the licensee reevaluated and concluded that the dose consequences with the door open would not have exceeded the FSAR reported value. The licensee used the as-found containment leakage in the reevaluation bounded by the accident analysis. The failure of the licensee to maintain adequate configuration control of the door was a violation of

TS 3.7.10, "Control Room Ventilation System." The enforcement aspects of this violation were addressed in Section 4OA7 of NRC Integrated Inspection Report 05000483/2003006. This issue was entered into the licensee's corrective action program as CAR 200305274. The inspectors did not identify any additional findings during review of the issue.

2. (Closed) LER 05000483/2004-006-00: Steam Generator A tube inspection results classified as C-3.

   During Refueling Outage 13, the licensee's steam generator inservice inspection concluded that greater than one percent of the Steam Generator A tubes were defective. The licensee classified the inspection results as C-3 in accordance with TS 5.5.9 and performed the required NRC reporting per Table 5.5.9-2. The licensee plugged all of the defective tubes prior to returning the steam generator to service. The licensee documented the issue in CAR 200403438. The inservice inspection activities and results were described in NRC Inspection Report 05000483/2004003, Section 1R08. No new findings were identified in the inspectors' review of the LER.

3. (Closed) LER 05000483/2003-006-01: Emergency procedure problem identified that could have impacted operator actions and response times.

   The inspectors reviewed the LER and associated condition adverse to quality report (CAR 200304922) to verify that the licensee adequately addressed the causes of the condition and performed appropriate corrective actions. The licensee identified an error in Emergency Operating Procedure E-3, "Steam Generator Tube Rupture," during development of licensed operator training. The error resulted in the operator's inability to complete key accident mitigation steps within the timeframe assumed in the licensing bases. The licensee initially determined that the delay in completion of the E-3 sequence would result in postaccident off-site dose consequence in excess of regulatory limits. The licensee reported this condition as a safety system functional failure in LER 05000483/03-006-00. The licensee subsequently recalculated the dose consequences using actual reactor coolant dose equivalent iodine as the source term. The recalculation concluded that the actual postaccident dose would have been within regulatory limits. This issue was discussed in Callaway Plant Integrated Inspection Report 05000483/2003006 (URI 05000483/2003006-04) and dispositioned as a finding of very low safety significance (FIN 05000483/2004006-01) in Callaway Plant Integrated Inspection Report 05000483/2004006. The licensee entered the condition into the corrective action program as CAR 200304922. The inspectors reviewed the LER and no additional findings of significance were identified.

4OA4 Crosscutting Aspects of Findings

Section 1R14 documents a finding with human performance crosscutting aspects which involved the failure to classify and declare a UE after a protected area fire was not extinguished within 15 minutes of verification.

4OA5 OTHER

1. Temporary Instruction 2515/154: Spent Fuel Material Control and Accounting at Nuclear Power Plants

   The inspectors collected the data specified in Phases I and II of the temporary instruction. The data was forwarded to the individuals identified in the temporary instruction for consolidation and assessment.

2. (Closed) URI 05000483/2004003-02: Potential for Containment Sump Blockage by Unqualified Lead Blankets

   The inspectors reviewed the licensee's OE and environmental testing results associated with the installation of nonqualified lead shielding blankets inside containment. The inspectors completed an in-office review of CAR 200404836, containment recirculation sump blockage evaluation; "Evaluation of the Impact of Systems at the Callaway Plant Resulting from Installation of Lead Blankets Inside Containment," Westinghouse Electric Company, August 24; and "Nuclear Environmental Qualification Test Report of Various Lead Blankets," Wyle Laboratories, August 3. The findings associated with this review were discussed in Section 1R15 of this report.

3. Review of the Callaway Evaluation by the World Association of Nuclear Operators

   The World Association of Nuclear Operators conducted an assessment of the Callaway Plant between June 14 and 28. The inspectors reviewed the interim assessment report documenting the assessment results.

4OA6 Management Meetings

Exit Meeting Summary

On September 24, the resident inspectors presented their inspection results to Mr. W. Witt, Plant Manager, and other members of his staff who acknowledged the findings. The inspectors verified that no proprietary information was reviewed during the inspection.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Adamonis, Vice President, Projects and Application Engineering, Wesdyne
M. Evans, Manager, Nuclear Engineering
L. Graessle, Superintendent, Protective Services
M. Hale, Superintendent, Health Physics
L. Kanuckel, Superintendent, Quality Assurance
B. Montgomery, Inservice Inspection Engineer
J. Munson, Vice President, Operations, Wesdyne
D. Neterer, Superintendent, Operations
M. Reidmeyer, Supervisor, Regional Regulatory Affairs
W. Witt, Plant Manager
K. Young, Manager, Regulatory Affairs

LIST OF ITEMS OPENED AND CLOSED

Opened

05000483/2004004-01	NCV	Failure to classify and declare a UE as required by 10 CFR 50.54(q), 50.47(b)(4), and Section IV.B of Appendix E of 10 CFR Part 50 (Section 1R14)
05000483/2004004-02	NCV	Inadequate selection and suitability review of installation of lead radiation shield blankets in containment (Section 1R15)
05000483/2004004-03	URI	Postmaintenance test failed to identify a degraded TDAFW pump turbine bearing cooler (Section 1R19)

Closed

05000483/2003-007-01	LER	Failure to maintain a control room ventilation boundary resulted in an unanalyzed condition (Section 4OA3)
05000483/4004-006-00	LER	Steam Generator A tube inspection results classified as C-3 (Section 4OA3)
05000483/2003-006-01	LER	Emergency procedure problem identified that could have impacted operator actions and response times (Section 4OA3)
05000483/2004003-02	URI	Potential for containment sump blockage by unqualified lead radiation shield blankets (Section 4OA5)

05000483/2004004-01	NCV	Failure to classify and declare a UE as required by 10 CFR 50.54(q), 50.47(b)(4), and Section IV.B of Appendix E of 10 CFR Part 50 (Section 1R14)
05000483/2004004-02	NCV	Inadequate selection and suitability review of installation of lead radiation shield blankets in containment (Section 1R15)

DOCUMENTS REVIEWED

Procedures

APA-ZZ-00330, Preventive Maintenance Program, Revision 19

APA-ZZ-00741, Control of Combustible Materials, Revision 17

I&C Loop Calibration Surveillance Procedure ISL-NF-NB02A, Loop-Misc NB02A Degraded & UV to LSELS, Revision 16

I&C Loop Calibration Surveillance Procedure ISL-NF-NB02B, Loop-Misc NB02B Degraded & UV to LSELS, Revision 15

I&C Loop Calibration Surveillance Procedure ISL-NF-NB02C, Loop-Misc NB02C Degraded & UV to LSELS, Revision 14

I&C Loop Calibration Surveillance Procedure ISL-NF-NB02D, Loop-Misc NB02C Degraded & UV to LSELS, Revision 14

I&C Surveillance ISP-SM-LLOL3, Containment Personnel Access Hatch and Emergency Assess Hatch Barrel Leak Rate Test, Revision 4

ISF-EG-0F108, Functional Flow CCW Flow, Revision 6

ISF-EG-000L2, Functional Level CCW Surge Tank “B,” Revision 10

MTE-ZZ-QA015, MOVATS UDS Testing of Limitorque MOV Butterfly Valves, Revision 2

OTN-EC-00001, Fuel Pool Cooling and Cleanup System, Revision 20

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

OTN-GK-00001, Control Building HVAC System, Revision 13

OTS-FC-0004, Tripping Sequence of AFW Pump Tribune, Revision 4

OSP-AL-P002, TDAFW Pump Operability Inservice Test, Revision 43

OSP-AL-P002, TDAFW Pump Operability Inservice Test, Revision 45

OSP-AL-V001A, AFW Valve Test Data Sheet, Revision 29

OSP-AL-P0002, TDAFW Pump Operability Inservice Test, Revision 44

OPS-NE-002A, Diesel Generator “A” Normal Operating Parameter Log, Revision 10

OSP-NE-0024A, Diesel Generator “A” Rocker Arm Lubrication, Revision 8

WDI-STD-133, Paragon ET Imaging for the Inspection of Reactor Vessel BMI Tube Penetrations, Revision 0

WDI-STD-134, Paragon UT Procedure for Inspection of RPV Bottom Mounted Instrument Tube Penetrations, Revision 0

WDI-STD-141, Bottom Mounted Instrumentation UT Analysis Guidelines for Use With Paragon, Revision 0

WDI-STD-142, Paragon ET Analysis Guidelines for Inspection of Reactor Vessel BMI Tube Penetrations, Revision 0

Callaway Action Requests

200400185	200400186	200400290	200400676
200400822	200400977	200401427	200402154
200401017	200401215	200401403	200401830
200402574	200402763	200400629	200400791
200401167	200405171	200404734	200404733
200404597	20040498	200403909	

Drawings

Control Logic Diagram, J-22EC01, Fuel Pool Cooling and Clean Up System, Revision 0
Piping and Instrumentation Diagram M-22EC01, Fuel Pool and Clean Up System, Revision 18
Piping and Instrumentation Diagram M-22EC02, Fuel Pool and Clean Up System, Revision 21
Piping and Instrumentation Diagram M-22EF01, Essential Service Water System, Revision 46
Piping and Instrumentation Diagram M-22EF02, Essential Service Water System, Revision 51
Piping and Instrumentation Diagram M-22GK01, Control Building HVAC, Revision 13
Piping and Instrumentation Diagram M-22GK02, Control Building HVAC, Revision 16
Piping and Instrumentation Diagram M-22GK03, Control Building HVAC, Revision 18
Piping and Instrumentation Diagram M-22GK04, Control Building HVAC, Revision 16
Schematic Diagram, E-23EC01, Fuel Pool Cooling Pumps, Revision 3
Schematic Diagram, E-23EC02, Fuel Pool Cooling Pumps, Revision 21
Schematic Diagram, E-23EC03, Fuel Pool Cooling Pumps, Revision 1
Schematic Diagram, E-23EC04, Fuel Pool Cooling Pumps, Revision 1

Event Review Team Meeting Summaries

Small fire on the communication corridor roof, dated September 20, 2004
Small fire on the communication corridor roof, second ERT, dated September 22, 2004

Quality Assurance Surveillance Reports

SP04-015, dated June 2, 2004, Quality Assurance observation of the pre-job and ALARA briefs for the reactor head lift

SP04-016, dated June 8, 2004, Quality Assurance surveillance to verify effective implementation of procedures, TSs, FAR commitments and plant policies related to handling nuclear fuel

SP04-023, dated June 10, 2004, Quality Assurance surveillance to assess the steam generator team modification of the sludge lance platform and the secondary shield wall opening

SP04-021, dated June 18, 2004, Quality Assurance surveillance to assess the removal and replacement of the feedwater isolation valve actuators

SP04-022, dated June 18, 2004, Quality Assurance surveillance to assess the motor-driven AFW pump automatic recirculation control check valve and motor-driven AFW pump seal modifications

SP04-035, dated June 22, 2004, Quality Assurance surveillance to verify Refuel 13 work activities associated with the emergency diesel generators

SP04-031, dated June 23, 2004, Quality Assurance surveillance to verify that appropriate tests are specified and performed

SP04-039, dated June 29, 2004, Quality Assurance surveillance to assess the adequacy of the ESW pipe examinations in Refuel 13

SP04-036, dated June 29, 2004, Quality Assurance surveillance to assess the adequacy of the performance and evaluation of the 10-year reactor vessel inservice inspection examinations

AP04-007, dated August 11, 2004, Quality Assurance audit of environmental monitoring

SP04-020, dated September 7, 2004, Quality Assurance Surveillance to verify that operations personnel maneuver and manipulate the plant in accordance with requirements and expectations during plant heatup and power ascension following Refuel 13

LIST OF ACRONYMS

AFW	auxiliary feedwater
CAR	Callaway Action Request
CCW	component cooling water
EDG	emergency diesel generator
ESW	essential service water
FSAR	Final Safety Analysis Report
LOCA	loss of coolant accident
LER	licensee event report
NCV	noncited violation
OE	operability evaluation
PMTs	postmaintenence tests
TDAFW	turbine-driven auxiliary feedwater
TSs	Technical Specifications
UE	Unusual Event
URI	unresolved item