**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-483/95-17

License: NPF-30

Licensee: Union Electric Company
P.O. Box 149
St. Louis, Missouri

Facility Name: Callaway Plant

Inspection At: Callaway Plant, Steedman, MO

Inspection Conducted: November 12 through December 23, 1995

Inspectors: D. G. Passehl, Senior Resident Inspector
F. L. Brush, Resident Inspector
K. M. Thomas, Project Manager, Office of Nuclear Reactor Regulation

Approved: WD Johnson
William D. Johnson, Chief, Project Branch B

1/5/96
Date

Inspection Summary

Areas Inspected: Routine, unannounced inspection of onsite response to events, operational safety verification, plant support activities, maintenance observations, surveillance observations, Office Of Nuclear Reactor Regulation review of licensee submittals, and onsite engineering.

Results:

Onsite Response to Events

The licensee's overall response to an electrical near miss event was satisfactory. However, lack of attention to detail was evident on the part of two maintenance electricians who accessed a wrong electrical cabinet to perform preventive maintenance (Section 2.1).

Operational Safety Verification

Operational activities conducted during this inspection period were satisfactory. Overall, plant operators maintained a satisfactory level of awareness of plant equipment status. However, there was one instance of operator inattentiveness to the main control board (Section 3.1).

- Overall plant material condition was satisfactory. Improvements were warranted in housekeeping in various areas of the plant (Section 3.2).

Plant Support Activities

- The licensee's overall performance was satisfactory. No significant items were identified in the Security area (Section 4.2).

- A system alignment error by radioactive waste handling technicians caused an inadvertent transfer of water from Recycle Holdup Tank B to Recycle Holdup Tank A. The licensee's immediate response was satisfactory. An issue of improper system alignments in the Operations area was discussed in NRC Inspection Report 50-483/95-13 (Section 4.1.1).

- Tools and rags were observed lying across a contaminated boundary (Section 4.1.3).

Maintenance Observations

- The licensee's overall performance was satisfactory. The licensee continued to identify needed improvements to maintenance procedures. Some maintenance procedure weaknesses were discussed in previous NRC Inspection Report 50-483/95-13 (Section 5.1.1).

- Appropriate administrative controls, such as foreign material exclusion, were noted for the maintenance activities observed (Section 5.1.2).

Surveillance Observations

- Surveillance testing was conducted satisfactorily. A pretest briefing weakness was observed during testing of Train A of the residual heat removal system. Questions that arose during the actual performance of the test were not identified and discussed during the pretest meeting (Section 6.1.1).

- There was satisfactory coordination and communication among Engineering and Operations personnel during performance of a special high pressure feedwater heater test. Plant operators closely monitored the plant to ensure primary system parameters remained within allowable limits (Section 6.1.2).

- There was satisfactory support from Maintenance and Engineering personnel during a test of an auxiliary feedwater pump. The inspector identified some minor material condition deficiencies that the licensee addressed with work requests (Section 6.1.3).

Onsite Engineering

- System Engineering performed a satisfactory review of a potentially generic issue pertaining to Models NH91-B and -B1 hydramotor valves. The inspector noted that the documented basis for the operability determination was lacking (Section 5.1.1).

- Engineering personnel provided appropriate assistance to Operations and Maintenance personnel during performance of a high pressure feedwater heater bypass test (Section 6.1.2).

- Support from Engineering personnel was appropriate during performance of a turbine-driven auxiliary feedwater pump test (Section 6.1.3).

Summary of Inspection Findings:

- An unresolved item was identified (Section 4.1.1).

Attachment:

- Persons Contacted and Exit Meeting

## DETAILS

### 1 PLANT STATUS

At the beginning of the inspection period, the plant operated at approximately 98.5 percent power. The plant had been limited to approximately 98.5 percent power because of reduced steam generator pressure conditions following chemical cleaning during the last refueling outage. The licensee formed a task team to evaluate ways of increasing the plant's electrical generation while still operating within allowable limits. The option chosen was to operate the plant with High Pressure Feedwater Heater Bypass Valve AEHV0038 partially open. Plant operators established long-term operation with Valve AEHV0038 open on December 1[illegible] 1995, and reactor power subsequently increased to 100 percent power. The inspector observed testing associated with the opening of Valve AEHV0038 (Section 6.1.2).

No major changes in plant status occurred during this inspection period. At the end of the inspection period, the plant was at full power.

### 2 ONSITE RESPONSE TO EVENTS (93702)

#### 2.1 Potential for Injury During Planned Electrical Maintenance

On November 21, 1995, an electrician was involved in an event that had the potential to cause a fatal injury. Plant electricians were performing planned maintenance on nonsafety-related electrical equipment on Bus PG105. Bus PG105 is normally fed by Transformer XPG105, a Stepdown 13.8kV/480V transformer. Bus PG105 supplies power to various fire protection equipment. An electrician was attempting to verify that the secondary side of the transformer was deenergized using a multimeter. The electrician opened the back of the wrong cubicle and inadvertently got on the hot 13.8kV side of the disconnect, which caused a short to ground. No one was injured, although the journeyman electrician and his apprentice were distressed. The short to ground caused some protective relaying to actuate. Breaker PA0209, the feed to the disconnect for Bus PG105, tripped open. This in turn caused other nonsafety-related electrical loads normally fed by Breaker PA0209 to automatically transfer to an alternate supply. Two electrical buses that supply power to demineralized water and water treatment equipment failed to transfer as expected. The licensee initiated work requests to make the necessary repairs.

The licensee formed an Event Review Team shortly after the event to begin the investigation. The root cause was personnel error by the maintenance electricians. The licensee's recommended corrective actions included:

Reviewing the adequacy of work instructions for this type of work;

Reviewing the adequacy of the tagging boundaries;

- Reviewing the adequacy of safety equipment; and

- Reviewing the adequacy of training for electricians and equipment operators on the dangers of working with high voltage equipment.

The inspector determined that the licensee's immediate and followup responses to this event were satisfactory.

2.2 Conclusions

The inspector determined that the licensee's overall response to the event was satisfactory. Lack of attention to detail was evident on the part of two maintenance electricians who accessed the wrong electrical cabinet to perform preventive maintenance.

## 3 OPERATIONAL SAFETY VERIFICATION (71707)

3.1 Routine Control Room Observations

The inspectors observed operational activities throughout this inspection period to verify that adequate control room staffing and control room professionalism were maintained. Shift turnover meetings were conducted in a manner that provided for proper communication of plant status from one shift to the other. Control room indications of various valve and breaker lineups were verified for current plant status. Discussions with operators indicated that they were aware of plant status, equipment status, and reasons for lit annunciators.

However, the inspectors noted one instance of lack of operator attentiveness to the main control board. The inspectors had been in the control room to review plant and equipment status at the start of the day shift on one morning. Most of the operators were at the shift supervisor's office reviewing turnover information and preparing for the day's activities. The reactor operator at the controls was observed with his back to the main control board for a period of several minutes duration that the inspectors were in the control room. This observation was discussed with plant management.

3.2 Plant Tours

The inspectors routinely toured various areas of the plant to assess the safety conditions and adequacy of plant equipment. The inspectors verified that various valve and switch positions were correct for the current plant conditions. Piping and instrumentation drawings and operating instructions posted in vital areas were inspected and found to be current. Personnel were observed obeying rules for escorts, visitors, entry, and exits into and out of vital areas.

During one tour the inspectors noted a large amount of boric acid at the pump casing flanges on Residual Heat Removal Pump P001A. Health Physics personnel cleaned up the boric acid so that a determination of the source of the leak could be made.

The inspectors noted that housekeeping throughout the plant was inconsistent. Most areas of the auxiliary building appeared well kept. During one tour, the inspector noted that a radiological controls area had remained established following maintenance completed several days earlier on containment normal sump discharge header auxiliary building flow Control Valve LF FV-0096. The area had been clean prior to the work. The inspector discussed this with appropriate Health Physics personnel. The area had not been restored because of work priorities. Also, some areas of the turbine building were in need of housekeeping improvements. Workers had begun cleaning various areas of the turbine building later in this inspection period.

### 3.3 Conclusions

Operational activities conducted during this inspection period were satisfactory. Overall, plant operators maintained a satisfactory level of awareness of plant equipment status. However, the inspectors identified one instance of operator inattentiveness to the main control board. A similar concern was identified in NRC Inspection Report 50-483/95-06.

Overall plant material condition was satisfactory. Improvements were warranted in housekeeping in various areas of the plant.

## 4 PLANT SUPPORT ACTIVITIES (71750)

### 4.1 Radiological Protection Program Observations

During this inspection period, the inspectors verified that selected activities of the licensee's radiological protection program were properly implemented. Health Physics personnel were observed routinely touring the radiologically controlled areas. Contaminated areas and high radiation areas were properly posted, and restricted high radiation areas were found to be locked, as required. Area surveys, posted outside each room in the auxiliary building, were found to be current. These survey readings were found to be similar to readings obtained by the inspector with the use of the NRC's survey meter.

#### 4.1.1 Valve Alignment Error During Transfer of Recycle Holdup Tank A to Boric Acid Tank A

On December 19, 1995, the licensee identified a system alignment error during transfer of the contents of Recycle Holdup Tank B to Boric Acid Tank B. Plant operators had requested the transfer to fill Boric Acid Tank B to clear a low level annunciator on the tank.

Plant procedures required that Recycle Holdup Tank B be recirculated and sampled prior to the transfer. After sampling, operators use a second procedure to realign the system to perform the transfer. In this instance, a valve alignment error occurred in that the recirculation lineup was not completely secured prior to lining up to perform the transfer. As a result, some flow from Recycle Holdup Tank B was diverted to Recycle Holdup Tank A through the recirculation path.

Operators first noticed the problem when Recycle Holdup Tank A level had increased 5 percent and Recycle Holdup Tank B level had decreased by 6 percent. Later, operators recovered from the error and correctly realigned the system to complete the transfer to Boric Acid Tank B.

The licensee's immediate response to this event was satisfactory. Management held a prompt Event Review Team meeting to begin the investigation into the causes and corrective actions for this event. The inspector discussed an issue of improper system alignments in NRC Inspection Report 50-483/95-13. Pending the inspector's review of the licensee's completed investigation, this is considered an Unresolved Item (483/9517-01).

4.1.3 Other Radiological Protection Program Observations

During a surveillance test observation (Section 6.1.1), the inspector observed miscellaneous tools and rags lying across a contaminated boundary. The inspector mentioned this to the Health Physics technician, who subsequently took corrective action.

4.2 Security Program Observations

The inspectors observed various aspects of the licensee's security program. Security personnel were found to perform their duties in a professional manner. Vehicles were properly controlled or escorted within the protected area. Designated vehicles parked and unattended within the protected were found to be locked and the keys removed. The inspectors routinely toured the protected area perimeter and found it maintained at a satisfactory level.

4.3 Conclusions

The licensee's overall performance was satisfactory. Most radiologically controlled areas were maintained at a satisfactory level of cleanliness.

The licensee's immediate response to a system alignment error resulting in inadvertent transfer of water from Recycle Holdup Tank B to Recycle Holdup Tank A was satisfactory. An issue of improper system alignments was discussed in NRC Inspection Report 50-483/95-13.

One observation was made regarding miscellaneous tools and rags lying across a contaminated boundary.

No significant items were identified in the security area.

## 5 MAINTENANCE OBSERVATIONS (62703)

The maintenance activities listed below were observed and documentation reviewed to verify that the activities were conducted in a manner which resulted in reliable safe plant operation.

### 5.1 Maintenance Observations

The following maintenance activities were observed:

#### 5.1.1 Work Requests 174785, 174786, 174787, and 174788; Adjust Spring Compression for Models NH91-B and -B1 Hydramotor Valves

The inspectors followed up on a potentially generic issue pertaining to Models NH91-B and -B1 hydramotor valves. This type of valve at another nuclear plant was found to be nonfunctional due to problems with the actuator adapter. The affected valves at Callaway were for the control room air conditioning Unit A (GKV0765) and Unit B (GKV0766) essential service water outlet isolation valves, and the Class 1E electric equipment air conditioning Unit A (GKV0767) and Unit B (GKV0768) essential service water outlet isolation valves. The function of the valves is to maintain proper room temperatures.

At issue at the other plant was a loose actuator adapter that resulted in the inability of the temperature control valve to fully stroke, thus rendering the valve incapable of properly controlling room temperatures for the affected equipment. The Callaway system engineer performed a visual inspection of the stem adapter jam nut which connects the actuator adapter to the actuator. In addition, the system engineer reviewed past performance of the affected valves. The system engineer identified no obvious problems. However, the system engineer identified that the spring compression lengths for the four valves were inconsistent with vendor recommendations.

The spring compression length correlates to the amount of force required to stroke the valves in the closed direction. The vendor-recommended spring compression length for the four valves was 9.55 $\pm$ 0.375 inches. The as-found spring compression lengths were 8.0 inches (GKV0765), 8.75 inches (GKV0766), 9.0 inches (GKV0767), and 8.25 inches (GKV0768). The system engineer wrote work requests to change the spring compression length of each of the four valves back to the nominal 9.55 inches during the next system outage. In addition, the system engineer identified where some improvements to the associated maintenance procedures could be made with regard to checking and setting the spring compression length.

The inspector questioned the system engineer about the basis of operability for the four valves. The system engineer stated that the basis for operability included satisfactory test performance, no observable problems, and no history of past problems. Although this justification was reasonable, it was not formally documented. A memorandum to the system engineer's supervisor simply stated that "Evaluations performed by the system engineer

ensure that the operability is not affected." The same type of wording appeared on the associated corrective action document (SOS 95-2240). The inspector found the documented operability determination to be lacking.

5.1.2 Work Instruction W170483; Disassemble, Inspect, and Repair Containment Normal Sump Discharge Header Auxiliary Building Flow Control Valve LF FV-0096

This valve was worked to repair excessive leakage through the valve. Foreign material exclusion controls were appropriately maintained. Support from Health Physics personnel in preventing the spread of contamination was satisfactory. The postmaintenance local leak rate test was satisfactory.

5.1.3 Work Instruction G570507-067; Torque Gland Follower Nuts on Normal Charging Pump Discharge Header Flow Control Valve BG FCV-0124

The inspector observed good communication and coordination among Operations, Health Physics, and Maintenance personnel. Subsequent stroke testing was satisfactory.

5.2 Other Maintenance Observed

The inspector reviewed the following maintenance activities and had no significant observations:

- Work Instruction W174798, Repair Damaged Exhaust Ductwork in the Auxiliary/Fuel Building Common Exhaust Duct to the Unit Vent

- Work Instruction W175320, Replace Sudden Pressure Relay in Safeguards Transformer A

5.3 Conclusions

The licensee continued to identify needed improvements to maintenance procedures. A system engineer identified where some improvements to Models NH91-B and -B1 hydramotor valves maintenance procedures could be made. Some maintenance procedure weaknesses were discussed in NRC Inspection Report 50-483/95-13.

Appropriate administrative controls, such as foreign material exclusion, were observed for maintenance conducted during this inspection. Satisfactory communication and coordination was observed among Operations, Health Physics, and Maintenance personnel.

## 6 SURVEILLANCE OBSERVATIONS (61726)

The inspectors observed the surveillance testing listed below to verify that the activities were performed in accordance with the licensee's approved programs and the Technical Specifications.

6.1 Surveillance Observations

The following surveillance activities were observed:

6.1.1 OSP-EJ-P001A, "Section XI Residual Heat Removal Train A Operability"

The inspectors had the following observations:

- There were weaknesses in the pretest brief. Questions arose during the actual performance of the test that were not identified and discussed during the pretest meeting. For example, the control room operator performing the test was confused on the accuracy of a list of valves at step 6.2 that had to be opened and had to refer to the flow diagram on the main control board. Also, the control operator was confused about interpreting some data taken during step 6.1.13 of the procedure. This was the first time the procedure was performed since the procedure was revised in early November 1995.

- There were miscellaneous tools and rags lying across the contaminated boundary. The inspector mentioned this to the Health Physics technician, who subsequently took corrective action.

6.1.2 ETP-AE-ST004, "High Pressure Feedwater Heater Bypass Test"

Callaway had operated at approximately 98.3 percent reactor power since the last refueling outage because of steam generator pressure limitations. Callaway experienced two reactor trips and a forced outage since the last refueling outage. The combination of these events would have led to low fuel burnup at the next scheduled refueling outage. As a result, the licensee formed a task team to evaluate ways of increasing the plant's electrical generation and consume the excess fuel. The option chosen was to operate the plant with High Pressure Feedwater Heater Bypass Valve AEHV0038 open. The licensee conducted this special test to quantify additional electrical power production available for operating the plant for the remaining cycle within allowable limits.

The inspector observed the test and saw that there was good coordination and communication among Engineering and Operations. Plant operators closely monitored the plant to ensure primary system parameters remained within allowable limits. Quantitative data was obtained on steam generator feedwater inlet temperature, generator electrical output, reactor power, main steam flow, and condenser backpressure.

The results of the test were successful. Full power was attained with Valve AEHV0038 approximately 9 percent open. Plant engineers evaluated operating for the remaining cycle with Valve AEHV0038 open under Request for Resolution 16653A. On December 15, 1995, the licensee began to operate with Valve AEHV0038 9 percent open.

6.1.3 OSP-AL-P00002, "Section XI Turbine-Driven Auxiliary Feedwater Pump Operability"

Performance of this test was well coordinated. The backup Auxiliary Feedwater System Engineer was present to observe the test and assisted a Maintenance Planner in planning a job to refurbish leaking gland seals on the turbine. The inspector observed a small amount of leakage from union fittings on bearing cooling water lines. The equipment operator initiated work requests.

6.1.4 OSP-KC-00001, "Fire Pump Starting Test for Fire Water Storage Tank Inspection"

The inspector observed two material condition deficiencies:

- Diesel/electric fire water pump to fire water storage tank header Isolation Valve VKC1038D had significant packing leakage.

- The outboard seal of diesel-driven Fire Pump 2A also had packing leakage.

The system engineer had maintenance personnel tighten the packing on Valve VKC1038D. Also, the system engineer stated that he would observe the next test of diesel-driven Fire Pump 2A to determine the acceptability of the leakage.

6.1.5 OSP-SH-00001, "Post Accident Monitoring Channel Check"

The inspector observed testing of the incore thermocouples and identified a minor problem. A small portion of the light emitting diode display was cut off for the incore thermocouple at Core Location A06. The operator performing the test initiated a work request to repair the indication for Core Location A06.

6.2 Conclusions

Overall surveillance testing activities were satisfactorily performed. Activities were accomplished with appropriate procedures and in accordance with license conditions. Satisfactory teamwork was observed during most activities. Engineering support was evident during tests as needed. Plant operators maintained an acceptable level of awareness of plant conditions during testing to permit full power operation. Work requests were appropriately initiated for identified material condition deficiencies. A pretest briefing weakness was observed during residual heat removal Train A testing in that questions arose during the actual performance of the test that were not identified and discussed during the pretest meeting.

## 7 ONSITE ENGINEERING (37551)

7.1 The following observations were made with regard to onsite Engineering:

System Engineering performed a satisfactory review of a potentially generic issue pertaining to Models NH91-B and -B1 hydramotor valves. The inspector noted that the documented basis for the operability determination was lacking (Section 5.1.1).

Engineering personnel provided appropriate assistance to Operations and Maintenance personnel during performance of Procedure ETP-AE-ST004, "High Pressure Feedwater Heater Bypass Test" (Section 6.1.2).

Support from Engineering personnel was appropriate during performance of Procedure OSP-AL-P00002, "Section XI Turbine-Driven Auxiliary Feedwater Pump Operability" (Section 6.1.3).

7.2 Conclusions

Onsite Engineering activities were conducted satisfactorily, but a weakness was noted in the documentation of an operability evaluation for hydramotor valves.

ATTACHMENT

## 1 PERSONS CONTACTED

### 1.1 Licensee Personnel

M. S. Evans, Superintendent, Health Physics
J. M. Gloe, Superintendent, Maintenance
R. T. Lamb, Superintendent, Operations
J. V. Laux, Manager, Quality Assurance
C. D. Naslund, Manager, Nuclear Engineering
J. R. Peevy, Manager, Emergency Preparedness and Organizational Support
G. L. Randolph, Vice President, Nuclear Operations
M. A. Reidmeyer, Engineer, Quality Assurance

The above licensee personnel attended the exit meeting. In addition to these personnel, the inspectors contacted other personnel during this inspection period.

## 2 EXIT MEETING

An exit meeting was conducted on December 21, 1995. During this meeting, the inspectors reviewed the scope and findings of the report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.