

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-483
License No.: NPF-30
Report No.: 50-483/98-21
Licensee: Union Electric Company
Facility: Callaway Plant
Location: Junction Highway CC and Highway O
Fulton, Missouri
Dates: August 16 through September 26, 1998
Inspector(s): D. G. Passehl, Senior Resident Inspector
F. L. Brush, Resident Inspector
Approved By: W. D. Johnson, Chief, Project Branch B

ATTACHMENT: Supplemental Information

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EXECUTIVE SUMMARY

Callaway Plant
NRC Inspection Report 50-483/98-21

Operations

- Operator response to an equipment failure, which caused a pressure transient and damaged valves in the boron thermal regeneration system, and the subsequent reduction of volume control tank level was good. Operators quickly diagnosed the event and took actions which minimized the loss of water from the chemical and volume control system. The licensee successfully repaired the damaged valves and restored the system to service (Section O4.1).
- Control room operator response to the loss of main feedwater pump automatic speed control was very good. The operators quickly recognized the condition and took manual control of the main feedwater pumps. Operators quickly restored steam generator water level to the programmed band (Section O4.2).
- In violation of Technical Specification 3.0.4, the licensee failed to ensure operability of the turbine-driven auxiliary feedwater pump prior to entering Mode 3. This occurred as a result of a deficient Mode 4 to Mode 3 checklist. The licensee revised the checklist to ensure the system was in the proper lineup for plant startup. This was a noncited violation (Section O8.1).

Maintenance

- Material condition and housekeeping of the auxiliary building, fuel building, control building, diesel generator building, essential service water pump house, and turbine building was good. The inspectors identified few discrepancies during plant tours. The licensee documented these discrepancies and initiated corrective action (Section M2.1).
- In violation of Technical Specification 3.2.5, the licensee failed to calibrate the feedwater temperature detectors used to calculate reactor coolant system flow rate. The licensee determined that personnel misinterpreted the associated surveillance procedure. The licensee revised the procedure to ensure the calibration would be performed within the required time frame. The licensee determined that past flow rate calculations were acceptable because conservative calibration uncertainties were already included in the surveillance procedure. This was a noncited violation (Section M8.1).

Engineering

- The licensee failed to revise three component cooling water system valve surveillance procedures and to make associated revisions to the work control process in a timely manner following implementation of Technical Specification Amendment 113 (Section E3.1).

Report Details

Summary of Plant Status

The plant began the report period August 16, 1998, at 100 percent power. On September 24, 1998, operators reduced reactor power to 90 percent to repair a low pressure feedwater heater. On September 25, 1998, operators returned the plant to 100 percent power.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious. Plant status, operating problems, and work plans were appropriately addressed during daily turnover and plan-of-the-day meetings. Plant testing and maintenance requiring control room coordination were properly controlled. The inspectors observed several shift turnovers and noted a minor problem with the thoroughness of one turnover. The inspectors discussed this with the operations manager, who planned to discuss the problem during an operations department staff meeting.

O2 Operational Status of Facilities and Equipment

O2.1 Review of Equipment Tagouts (71707)

The inspectors walked down Workman's Protection Assurance Tagout 28271 for Containment Spray Pump A. The inspectors did not identify any discrepancies. The tagout was properly prepared and authorized. All tags were on the correct devices and the devices were in the position prescribed by the tags.

O2.2 Engineered Safety Feature System Walkdowns (71707)

The inspectors walked down accessible portions of the following engineered safety features and vital systems:

- Auxiliary Feedwater System Trains A, B, and T;
- Emergency Diesel Generators A and B; and
- Essential Service Water Train A.

Equipment operability, material condition, and housekeeping were acceptable.

O4 Operator Knowledge and Performance

O4.1 Unexpected Drain of Borated Water from the Chemical and Volume Control System

a. Inspection Scope (71707)

The inspectors reviewed an August 20, 1998, event when the licensee unexpectedly drained approximately 250 gallons of borated water from the chemical and volume control system.

The inspectors reviewed:

- Procedure OTO-BB-00003, "Reactor Coolant System Excessive Leakage," Revision 8;
- Procedure OTN-BG-00001, "Chemical and Volume Control System," Revisions 20 and 21; and
- Suggestion-Occurrence-Solution Report 98-3251.

b. Observations and Findings

The licensee was in the process of placing the boron thermal regeneration system in the "dilute" mode at the time of the event. The reactor operator noted that letdown pressure indication spiked from the nominal value of 350 psi to about 500 psi. The reactor operator immediately operated the letdown heat exchanger outlet pressure control valve to maintain nominal pressure.

Shortly after this, the reactor operator noted that level of the volume control tank was decreasing. The operator secured flow through the boron thermal regeneration system and entered Procedure OTO-BB-00003. The decrease in volume control tank level stopped when the reactor operator secured flow. Operators successfully performed the immediate actions of Procedure OTO-BB-00003. Operators also performed a reactor coolant system inventory balance with satisfactory results.

Equipment operators later reported water in the auxiliary building rooms housing the boron thermal regeneration system. The licensee determined that the pressure spike resulted in the rupturing of gaskets on several diaphragm valves.

The licensee convened an event review team and initiated Suggestion-Occurrence-Solution Report 98-3251 to document the investigation. The licensee later confirmed that chemical and volume control system moderating heat exchanger to reactor coolant filter control Valve BGUV7022 did not open when placing the boron thermal regeneration system in the "dilute" mode. Prior to this event, however, the licensee had a computer point indication showing Valve BGUV7022 to be open.

The licensee identified that the primary cause of this event was the failure of Valve BGUV7022 to open. The licensee determined that the position of Valve BGUV7022 on the plant computer was in error. The position indication of Valve BGUV7022 was fed by the position of chemical and volume control system moderating heat exchanger to letdown chiller heat exchanger control Valve BGUV7002A. Because Valve BGUV7002A indicated open, Valve BGUV7022 indicated open.

The licensee's corrective actions included repairing the damaged valves and decontaminating the boron thermal regeneration system rooms and associated equipment. The licensee removed the faulty computer indication for Valve BGUV7022. The licensee revised Procedure OTN-BG-00001 to require local verification of the position of Valve BGUV7022 prior to establishing flow through the boron thermal regeneration system.

The inspectors reviewed the licensee's response and corrective actions and had no concerns. The inspectors determined that the error in the computer database for the position of Valve BGUV7022 was an isolated computer configuration control weakness.

c. Conclusions

The inspectors concluded that operator response to an equipment failure which caused a pressure transient and damaged valves in the boron thermal regeneration system and subsequent reduction of volume control tank level was good. Operators quickly diagnosed the event and took actions which minimized the loss of water from the chemical and volume control system. The licensee successfully repaired the damaged valves and restored the system to service.

O4.2 Loss of Main Feedwater Pump Automatic Speed Control

a. Inspection Scope (62707)

The inspectors reviewed control room operators' response to a loss of main feedwater pump automatic speed control.

b. Observations and Findings

On September 1, 1998, with the plant at 100 percent power, a fuse blew in the power supply for both main feedwater pumps' speed control circuit. Main feedwater Pump A was in manual and main feedwater Pump B was in automatic speed control. Main feedwater Pump B speed decreased when the power supply failed. The operators immediately recognized the loss of automatic speed control and placed the main feedwater pump master controller in manual. The operators stabilized feedwater flow to the steam generators. The water level in three steam generators had decreased approximately 5 percent from the programmed level. The control room operators quickly restored level to the normal operating range. The licensee replaced the power supply and restored the main feedwater system to the normal operating lineup.

c. Conclusions

The inspectors concluded that the control room operator response to the loss of main feedwater pump automatic speed control was very good. The operators quickly recognized the condition and took manual control of the main feedwater pumps. Operators quickly restored steam generator water level to the programmed band.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Licensee Event Report 50-483/98-005-00: mispositioning of the warm-up steam supply valves for the turbine-driven auxiliary feedwater pump.

On May 1, 1998, during plant startup from the Spring 1998 refueling outage, control room operators found the warm-up steam supply valves for the turbine-driven auxiliary feedwater pump closed. With the warm-up valves closed, condensate from the main steam system could accumulate in the steam supply lines and render the pump inoperable.

At 8:30 p.m. (CDT), on April 30, 1998, the plant entered Mode 3 from Mode 4 with the warm-up supply valves closed. These valves were required to be open to consider the pump operable. At 10:29 p.m. on May 1, 1998, the steam supply warm-up valves were found to be closed and immediately reopened to restore the system to an operable status. Technical Specification Section 3.0.4 requires, in part, that entry into an operational mode shall not be made unless the conditions for the Limiting Conditions for Operation are met without reliance on provisions contained in the action requirements. Technical Specification 3.7.1.2.b requires that the turbine-driven auxiliary feedwater pump be operable in Mode 3.

The licensee determined that the Mode 4 to Mode 3 checklist was deficient in that operators were not required to verify that the valves were open. The licensee revised the checklist to ensure that the system was in the proper lineup for plant startup.

The inspectors concluded that, in violation of Technical Specification 3.0.4, the licensee failed to ensure operability of the turbine-driven auxiliary feedwater pump prior to entering Mode 3. This occurred as a result of a deficient Mode 4 to Mode 3 checklist. The licensee revised the checklist to ensure the system was in the proper lineup for plant startup. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-483/98021-01).

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments - Maintenance

a. Inspection Scope (62707)

The inspectors observed or reviewed portions of the following work activities:

- Work Authorization W625998 - Adjust and Test Emergency Diesel Generator B Field Under-Excitation Relay; and
- Work Authorization W625763 - Replace Cavity Cooling Fan A.

b. Observations and Findings

The inspectors identified no substantive concerns. All work observed was performed with the work packages present and in active use. The inspectors frequently observed supervisors and system engineers monitoring job progress, and quality control personnel were present when required.

M1.2 General Comments - Surveillance

a. Inspection Scope (61726)

The inspectors observed or reviewed all or portions of the following test activities:

- Test Procedure ISF-SB-OA33A, "Fctnal-Anal; SGTC Train B Fctnal Test," Revision 15;
- Test Procedure OSP-BG-P005B, "Centrifugal Charging Pump B Inservice Test," Revision 21;
- Test Procedure OSP-NE-0001A, "Standby Diesel Generator A Periodic Test," Revision 3; and
- Test Procedure OSP-AL-P0002, "Turbine Driven Aux Feedwater Pump Inservice Test," Revision 25.

b. Observations and Findings

The surveillance tests observed were conducted satisfactorily in accordance with the licensee's approved programs and the Technical Specifications.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Review of Material Condition During Plant Tours

a. Inspection Scope (62707)

The inspectors performed routine plant tours to evaluate plant material condition.

b. Observations and Findings

The inspectors observed that material condition and housekeeping of the auxiliary building, fuel building, control building, diesel generator building, essential service water pump house, and turbine building were good. The inspectors identified few discrepancies during plant tours. The licensee documented these discrepancies and initiated corrective action.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) Licensee Event Report 50-483/98-004-00: missed calibration of feedwater temperature detectors.

On May 2, 1998, during a review of procedures that implemented the requirements of Technical Specification 4.2.5.4, the licensee determined that the feedwater temperature detectors had not been calibrated within 7 days of performing a plant precision heat balance since original plant startup in 1984. Technical Specification 4.2.5.4 required feedwater temperature detector calibration within 7 days of performing a plant precision heat balance. The output from the feedwater temperature detectors is used in the reactor coolant system flow rate calculations required by Technical Specification 3.2.5. The licensee successfully performed the calibration within 7 days following a heat balance during startup from the Spring 1998 refueling outage.

The licensee determined that the failure to perform the feedwater detector calibrations did not adversely affect past reactor coolant system flow rate calculations. Measurement uncertainties for the feedwater temperature detectors were already included in the reactor coolant system flow calculations.

The licensee determined the root cause to be personnel error. Licensee personnel misinterpreted information in engineering surveillance Procedure ESP-BB-03015, "Reactor Coolant Flow Measurement," Revision 18, developed by the reactor vendor. The licensee revised the procedure to include the calibration requirements.

The inspectors concluded that, in violation of Technical Specification 3.2.5, the licensee failed to calibrate the feedwater temperature detectors used to calculate reactor coolant system flow rate. The licensee determined that personnel misinterpreted the associated surveillance procedure. The licensee revised the procedure to ensure the calibration would be performed within the required time frame. The licensee determined that past flow rate calculations were acceptable because conservative calibration uncertainties

were already included in the surveillance procedure. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-483/98021-02).

III. Engineering

E3 Engineering Procedures and Documentation

E3.1 Failure to Implement Administrative Controls for Technical Specification Amendment 113

a. Inspection Scope (37551)

The inspectors identified that the licensee had not implemented administrative controls for Technical Specification Amendment 113 prior to the effective date.

The inspectors reviewed the following:

- Technical Specification Amendment 113;
- NRC letter to licensee, "NRR Audit of Licensee Programs for Managing Commitments Made to the NRC," June 30, 1998;
- Generic Letter 91-08, "Removal of Component Lists From Technical Specifications," May 6, 1991;
- Administrative Procedure APA-ZZ-00108, "Primary Licensing Documents: Change/Revision Process," Revision 10;
- ULNRC-3227, "Revision to Technical Specification 3/4.6 Containment Isolation Valves," June 26, 1995;
- ULNRC-3320, "Revision to Technical Specification 3/4.6 Containment Isolation Valves," Request for Additional Information, February 2, 1996; and
- ULNRC-3406, "Amendment Number 113," July 26, 1993.

b. Observations and Findings

On June 26, 1995, the licensee submitted operating license Application ULNRC-3227 to extend the allowed outage time from 4 to 12 hours for certain component cooling water system motor-operated containment isolation valves. The purpose was to allow more time for troubleshooting, repair, and testing. The valves to which the application applied were:

- Component Cooling Water to Containment Outer Isolation Valve EGHV0058;
- Component Cooling Water from Containment Outer Isolation Valve EGHV0059;
- Component Cooling Water from Reactor Coolant System Inner Containment Isolation Valve EGHV0060;
- Component Cooling Water from Reactor Coolant Pump Thermal Barrier Outer Containment Isolation Valve EGHV0061; and
- Component Cooling Water from Reactor Coolant System Inner Containment Isolation Valve EGHV0062.

In order to obtain approval, the NRC required that associated bypass valves be capable of stroking under design basis conditions. An alternative was to require that an individual be stationed at the bypass valves and be able to manually operate the valves upon instruction from control room operators. The licensee committed to these controls in Application ULNRC-3320 dated February 2, 1996. The associated bypass valves were:

- Component Cooling Water to Containment Bypass EGHV0058 Isolation Valve EGHV0127;
- Component Cooling Water from Reactor Coolant System Containment EGHV0060 Bypass Isolation Valve EGHV0130;
- Component Cooling Water from Containment EGHV0059 Bypass Isolation Valve EGHV0131;
- Component Cooling Water from Reactor Coolant System Containment EGHV0062 Bypass Isolation Valve EGHV0132; and
- Component Cooling Water from Reactor Coolant Pump Thermal Barrier EGHV0061 Bypass Isolation Valve EGHV0133.

On June 28, 1996, the NRC issued Technical Specification Amendment 113, approving the licensee's application and revising the allowed outage times. On July 25, 1996, the licensee implemented Amendment 113.

On May 6, 1998, during an NRC audit of licensee programs for managing NRC commitments, the inspectors identified that the licensee had not implemented the controls the licensee committed to in Application ULNRC-3320.

Prior to issuance of Amendment 113, the licensee identified that bypass Valves EGHV0127, EGHV0130, and EGHV0131 were not capable of closing against differential pressure requirements. Prior to the effective date of the amendment, the

licensee had not revised system procedures to require an individual be stationed at the bypass valves and be able to manually operate the valves upon instruction from control room operators. Specifically:

- The licensee did not revise Procedure OSP-EG-V001A, "CCW Train A Section XI Valve Surveillance," Revision 15, until August 9, 1996.
- The licensee did not revise Procedure OSP-EG-V001B, "CCW Train B Section XI Valve Surveillance," Revision 12, until August 7, 1996.
- The licensee did not revise Procedure OSP-EG-00002, "CCW Bypass Valve Retest," Revision 2, until September 21, 1996.

On September 11, 1998, the inspectors identified that the licensee performed Procedure OSP-EG-V001A on July 31, 1996, without implementing the administrative controls. The inspectors also identified that the licensee had not revised the work control process to implement the commitment prior to the effective date of Amendment 113. Maintenance work packages contain "Engineered Controlled Notes," which identify important information for specific pieces of equipment. The licensee did not create the notes that reflected the commitment until after Amendment 113 was effective.

The licensee identified that the reason the affected documents were not revised was because no additional impact reviews were performed for changes made to the original amendment request.

The licensee used existing Suggestion-Occurrence-Solution Report 96-0508 to document the investigation and corrective actions. The licensee had not closed this report because additional instances were identified of failure to update plant documents in accordance with Technical Specification and Final Safety Analysis Report changes. The licensee was using Suggestion-Occurrence-Solution Report 96-0508 to document the expanded investigation and corrective actions. The licensee initiated a review of licensing amendments issued between January 1, 1993, and December 31, 1997. The purpose was to identify and review amendments that had additional correspondence submitted to support the original amendment requests. The licensee proposed acceptable milestones for completing various stages of the reviews and taking action to correct any identified discrepancies. The licensee planned to complete the entire project by February 1999.

In addition, the licensee was revising Procedure APA-ZZ-00108 to ensure all elements of amendment packages are incorporated in plant procedures and programs.

c. Conclusions

The licensee failed to revise three component cooling water system valve surveillance procedures and to make associated revisions to the work control process in a timely manner following implementation of Technical Specification Amendment 113.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 General Comments (71750)

The inspectors observed health physics personnel, including supervisors, routinely touring the radiologically controlled areas. Licensee personnel working in radiologically controlled areas exhibited good radiation worker practices.

Contaminated areas and high radiation areas were properly posted. Area surveys posted outside rooms in the auxiliary building were current. The inspectors checked a sample of doors, required to be locked for the purpose of radiation protection, and found no problems.

V. Management Meetings

X1 Exit Meeting Summary

The exit meeting was conducted on September 25, 1998. The licensee did not express a position on any of the findings in the report.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. D. Affolter, Manager, Callaway Plant
H. D. Bono, Supervising Engineer, Regulatory Support
R. E. Farnam, Supervisor, Health Physics, Operations
D. E. Heinlein, Supervising Engineer
T. E. Herrmann, Supervising Engineer
S. P. Hogan, Maintenance Engineer
R. T. Lamb, Superintendent, Operations
J. V. Laux, Manager Quality Assurance
A. C. Passwater, Manager, Corporate Nuclear Services
G. L. Randolph, Vice President and Chief Nuclear Officer
M. A. Reidmeyer, Engineer, Quality Assurance Regulatory Support
M. E. Taylor, Assistant Manager, Work Control
W. A. Witt, Superintendent, Systems Engineering

INSPECTION PROCEDURES USED

37551	Onsite Engineering
61726	Surveillance Observations
62707	Maintenance Observations
71707	Plant Operations
71750	Plant Support Activities
92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
92901	Followup - Plant Operations
92902	Followup - Maintenance

ITEMS OPENED AND CLOSED

Opened

98021-01	NCV	Mispositioning of warm-up steam supply valves (Section O8.1).
98021-02	NCV	Miscalibration of feedwater temperature detectors (Section M8.1).

Closed

98-005-00	LER	Mispositioning of warm-up steam supply valves (Section O8.1).
98021-01	NCV	Mispositioning of warm-up steam supply valves (Section O8.1).
98-004-00	LER	Miscalibration of feedwater temperature detectors (Section M8.1).
98021-02	NCV	Miscalibration of feedwater temperature detectors (Section M8.1).