



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**

REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064

September 13, 1999

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

SUBJECT: NRC INSPECTION REPORT NUMBER 50-483/99-08

Dear Mr. Randolph:

This refers to the inspection conducted on July 25 through September 4, 1999, at the Callaway Plant. The enclosed report presents the results of this inspection.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. These violations are being treated as noncited violations, consistent with Appendix C of the Enforcement Policy. These noncited violations are described in the subject inspection report. If you contest these violations or the severity level of these noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Callaway Plant.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if requested, will be placed in the NRC Public Document Room.

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

Sincerely,

/s/

William D. Johnson, Chief  
Project Branch B  
Division of Reactor Projects

Docket No.: 50-483  
License No.: NPF-30

Enclosure:  
NRC Inspection Report No.  
50-483/99-08

cc w/enclosure:  
Professional Nuclear Consulting, Inc.  
19041 Raines Drive  
Derwood, Maryland 20855

John O'Neill, Esq.  
Shaw, Pittman, Potts & Trowbridge  
2300 N. Street, N.W.  
Washington, D.C. 20037

H. D. Bono, Supervising Engineer  
Quality Assurance Regulatory Support  
Union Electric Company  
P.O. Box 620  
Fulton, Missouri 65251

Manager - Electric Department  
Missouri Public Service Commission  
301 W. High  
P.O. Box 360  
Jefferson City, Missouri 65102

Ronald A. Kucera, Director  
of Intergovernmental Cooperation  
P.O. Box 176  
Jefferson City, Missouri 65102

Otto L. Maynard, President and  
Chief Executive Officer  
Wolf Creek Nuclear Operating Corporation  
P.O. Box 411  
Burlington, Kansas 66839

Dan I. Bolef, President  
Kay Drey, Representative  
Board of Directors Coalition  
for the Environment  
6267 Delmar Boulevard  
University City, Missouri 63130

Lee Fritz, Presiding Commissioner  
Callaway County Court House  
10 East Fifth Street  
Fulton, Missouri 65151

Alan C. Passwater, Manager  
Licensing and Fuels  
AmerenUE  
One Ameren Plaza  
1901 Chouteau Avenue  
P.O. Box 66149  
St. Louis, Missouri 63166-6149

J. V. Laux, Manager  
Quality Assurance  
Union Electric Company  
P.O. Box 620  
Fulton, Missouri 65251

Jerry Uhlmann, Director  
State Emergency Management Agency  
P.O. Box 116  
Jefferson City, Missouri 65101

E-Mail report to T. Frye (TJF)  
 E-Mail report to D. Lange (DJL)  
 E-Mail report to NRR Event Tracking System (IPAS)  
 E-Mail report to Document Control Desk (DOCDESK)  
 E-Mail report to Richard Correia (RPC)  
 E-Mail report to Frank Talbot (FXT)

bcc to DCD (IE01)

bcc distrib. by RIV:  
 Regional Administrator                      Resident Inspector  
 DRP Director                                      RIV File  
 DRS Director                                      RITS Coordinator  
 Branch Chief (DRP/B)  
 Project Engineer (DRP/B)  
 Branch Chief (DRP/TSS)

DOCUMENT NAME: R:\\_CW\CW908RP.JFM

To receive copy of document, indicate in box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

|                 |  |                |  |                 |  |         |  |           |  |
|-----------------|--|----------------|--|-----------------|--|---------|--|-----------|--|
| RIV:RI          |  | SRI            |  | RII:RI          |  | RIV:DRS |  | C:DRP/B   |  |
| JDHanna         |  | JFMelfi        |  | RGibbs          |  | GMGood  |  | WDJohnson |  |
| 9/13/99 (T-WDJ) |  | 9/13/99(T-WDJ) |  | 9/13/99 (T-WDJ) |  | 9/13/99 |  | 9/13/99   |  |

OFFICIAL RECORD COPY

**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-483  
License No.: NPF-30  
Report No.: 50-483/99-08  
Licensee: Union Electric Company  
Facility: Callaway Plant  
Location: Junction Highway CC and Highway O  
Fulton, Missouri  
Dates: July 25 through September 4, 1999  
Inspectors: J. F. Melfi, Senior Resident Inspector  
J. D. Hanna, Resident Inspector  
R. A. Gibbs, Resident Inspector  
Approved By: W. D. Johnson, Chief, Project Branch B  
  
ATTACHMENT: Supplemental Information

## EXECUTIVE SUMMARY

### Callaway Plant NRC Inspection Report No. 50-483/99-08

#### Operations

- Operators demonstrated good communications, procedural adherence, and command and control during a reactor startup (Section O1.2).
- The inspectors independently verified operability of the auxiliary feedwater system. The system was well maintained as indicated by good cleanliness, material condition, system lineup, and state of support systems (Section O2.2).

#### Maintenance

- The overall material condition and housekeeping of several plant systems were good. The inspectors identified a few minor discrepancies for which the licensee initiated corrective action (Section M2.1).

#### Engineering

- Inconsistency with accepted industry practice and lack of formal controls to prevent inadvertent preconditioning could indicate a vulnerability to inadvertent preconditioning which could mask component degradation (Section E2.1).
- The licensee's heavy loads procedure was inadequate in that it allowed heavy load lifts over trains of the residual heat removal system. The failure to adequately control the heavy loads procedure constitutes a violation of 10 CFR Part 50, Appendix B, Criterion V. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Suggestion-Occurrence-Solution Report 98-3225 (Section E8.1).

#### Plant Support

- During the performance of swipe surveys associated with new fuel receipt inspection, health physics technicians and operators demonstrated good ALARA practices and were knowledgeable of radiological requirements (Section R4.1).
- The licensee's failure to control a vehicle (unattended with keys in ignition) within the protected area is a violation of Section 1.6.2 of the security plan. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Suggestion-Occurrence-Solution Report 99-1504 (Section S2.1).

## Report Details

### Summary of Plant Status

The plant began the report period on July 25, 1999, at 100 percent power. Operation at 100 percent power continued through August 11, when the rupture of a moisture separator reheater drain tank drain line forced a shutdown of the plant. The plant was maintained in Mode 3 through August 16, while repairs were performed. Reactor startup was performed on August 17, and 100 percent power was reached on August 21. The plant was maintained at approximately 100 percent power for the remainder of the inspection period, which ended September 4, 1999.

## 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 including the steam line break event response of August 11, 1999. Operators effectively prioritized annunciators and alarms and mitigated the effects of the steam line break. A more specific assessment of control room performance during the event will be addressed in NRC Inspection Report 50-483/99-11.

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 no problems.

#### O1.2 Startup and Criticality

##### a. Inspection Scope (71707)

On August 17, 1999, the inspectors observed operators performing a reactor startup following the completion of corrective actions for the August 11, 1999, plant shutdown.

##### b. Observations and Findings

Prior to startup, the inspectors reviewed licensee identified items that needed to be resolved prior to criticality. The inspectors found that the licensee had resolved these issues.

Operators conducted the reactor startup in accordance with Procedure OTG-ZZ-00002, "Reactor Startup," Revision 25. The licensee conducted a detailed prejob brief prior to commencing the startup. The operators followed the procedure and monitored the plant response and indications during the approach to criticality. Effective controls were used to operate the reactor in the presence of the axial offset anomaly. Operators used

proper three-part communication, and reactor engineers correctly performed inverse count rate plots to determine the control rod position where the reactor would become critical.

Operators withdrew control rods and criticality was achieved on August 17, 1999. The estimated critical position calculated by reactor engineering accurately predicted the rod height when the reactor became critical. The inspectors observed that the control room operators applied good command and control in responding to alarms.

c. Conclusions

Operators demonstrated good communications, procedural adherence, and command and control during a reactor startup.

**O2 Operational Status of Facilities and Equipment**

O2.1 Engineered Safety Feature System Walkdowns (71707)

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

- emergency diesel generator building ventilation
- residual heat removal system
- main steam system

Equipment operability, material condition, and housekeeping were acceptable.

O2.2 Auxiliary Feedwater System Walkdown

a. Inspection Scope (71707)

The inspectors performed a detailed walkdown of the accessible portions of the auxiliary feedwater system to independently verify its operability. The walkdown included portions of the turbine building and the control room. The inspectors also conducted a walkdown of ac and dc electrical systems and equipment that support the auxiliary feedwater system.

b. Observations and Findings

The inspectors verified that systems essential to system actuation and performance were operational (e.g., adequate lubricating oil levels, no excessive packing leakage, adequate material condition of room coolers). The inspectors also confirmed that the as-built configuration agreed with the appropriate documents, including system drawings, system lineup procedure, and Technical Specifications. No significant discrepancies were identified.

Selected instrumentation was found to be correctly installed, functioning, and displaying indications consistent with expected values. Power supplies and breakers were correctly aligned, functional, and available for components, such as the motor-driven auxiliary feedwater pumps that must activate upon receipt of an actuation signal. The piping penetration rooms, pump rooms, and spaces containing the steam generator admission valves were found to be free of ignition sources and flammable materials. Cleanliness was acceptable in all areas inspected. The inspectors observed minor discrepancies (e.g., an improperly maintained pipe hanger) in portions of the system. These discrepancies were referred to the licensee for corrective action.

c. Conclusions

The inspectors independently verified operability of the auxiliary feedwater system. The system was well maintained as shown by good cleanliness, material condition, system lineup, and state of support systems.

## 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 W195817, disassemble Valve AEV-0050 and repair seat
- Feedwater Heater 6B divider plate and ultrasonic tube inspections (subsequent to the steam line rupture of August 11, 1999)
- Work Authorization P637319, lubricate and cycle mechanical trip and throttle valve
- Work Authorization W643191, replace nuclear Instrument N43 Detector A and Detector B connections

b. Observations and Findings

The inspectors identified no substantive concerns with this maintenance. All observed work was performed with the work packages present and in active use. The inspectors frequently noticed 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 OSP-AL-P0002, "Section XI Turbine Driven Aux Feedwater Pump Operability," Revision 26
- Test Procedure, ISL-SE-00N43, "Loop-Nuc; Nuc Instrm PWR RNG N43," Revision 17

b. Observations and Findings

The surveillance testing was 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

a. Inspection Scope (62707)

The inspectors performed plant tours and reviewed licensee documents to evaluate plant material condition.

b. Observations and Findings

The inspectors observed material condition and housekeeping of the following systems:

- diesel building ventilation
- auxiliary feedwater
- residual heat removal
- component cooling water

The overall material condition and housekeeping were good. The inspectors observed minimal water or oil leakage from the applicable systems. Other examples of good material condition included properly supported components, well lit areas and appropriate lubricating oil levels. The inspectors identified a few minor discrepancies for which the licensee initiated corrective action. These minor defects included excessive dirt on the diesel building ventilation dampers and ducts and an oil leak on a diesel building ventilation system damper operator.

b. Conclusions

The overall material condition and housekeeping of several plant systems were good. The inspectors identified a few minor discrepancies for which the licensee initiated corrective action.

### **III. Engineering**

#### **E2 Engineering Support of Facilities and Equipment**

##### **E2.1 Inadvertent Preconditioning**

a. Inspection Scope (37551)

The inspectors reviewed the licensee's in-service testing program. In particular, the inspectors examined the adequacy of the surveillance testing to demonstrate the operability of system components and the acceptability of equipment preconditioning prior to surveillance test performance.

b. Observations and Findings

During the inspection period for NRC Inspection Report 50-483/99-05, the inspectors observed the performance of surveillance tests on the turbine-driven auxiliary feedwater pump. The inspectors observed the following:

- The turbine-driven auxiliary feedwater pump was run for its surveillance test (OSP-AL-P0002, Revision 26, "Section XI Turbine Driven Auxiliary Feedwater Pump Operability") prior to testing the trip/throttle valve (OSP-FC-V0001, Revision 16, "Section XI Auxiliary Feedwater Pump Turbine Valve Operability"). This sequencing exercised the trip/throttle valve (FCV-0312) prior to its stroke time testing.
- The stem of the trip/throttle valve was lubricated prior to performance of time testing. This lubrication was not performed as part of either of the aforementioned procedures.

Based on these observations, the inspectors reviewed these and other surveillance procedures used to verify equipment operability. The inspectors also discussed inadvertent preconditioning and means for prevention with licensee engineering staff, including in-service testing personnel. Based on these reviews, the inspectors determined that the licensee's definition of "preconditioning" requires an intent to purposefully affect the testing of a structure, system, or component. The licensee did not consider an action (e.g., lubrication of the stem of a motor-operated valve prior to response time testing) to be preconditioning if not done deliberately to affect the test.

Commonly accepted industry practice recognizes preconditioning as the alteration, variation, manipulation, or adjustment of the physical condition of a structure, system, or component before Technical Specification surveillance or ASME Code testing. In accordance with industry practice, preconditioning is acceptable if done for the purpose of protecting personnel or equipment or to meet manufacturer's recommendations. Industry practice has been that acceptable preconditioning should have been evaluated and documented in advance of the surveillance. Commonly accepted industry guidance (NUREG 1482, Guidelines for Inservice Testing at Nuclear Power Plants) does not recognize intent as a factor in evaluating and preventing preconditioning.

The inspectors determined that the licensee's ability to detect and prevent inadvertent preconditioning of structures, systems, and components was also negatively impacted by a lack of formal controls. This was demonstrated by the following examples:

- A precautionary statement in surveillance procedures (used to warn operators of a potential for inadvertent preconditioning) was the only formal prevention method used.
- Responsibility for detecting situations where inadvertent preconditioning may occur was incumbent upon the operators just prior to test performance.
- No formal protocols were employed to schedule or sequence work such that inadvertent preconditioning would not occur.
- While certain preconditioning activities (e.g., rocker arm prelubrication of emergency diesel generators) had been evaluated in the past, no method was routinely employed to evaluate and document acceptable preconditioning.

The inspectors did not identify any instances where inadvertent preconditioning had adversely affected component operability or influenced surveillance testing outcomes.

c. Conclusions

Inconsistency with accepted industry practice and lack of formal controls to prevent inadvertent preconditioning could indicate a vulnerability to inadvertent preconditioning which could mask component degradation.

**E8 Miscellaneous Engineering Issues (92903)**

**E8.1** (Closed) Licensee Event Report (LER) 50-483/98008-00: Heavy load movement discrepancy.

On August 14, 1998, the licensee identified that heavy load movement practices in the containment building were inconsistent with the heavy loads analysis. The analysis assumes that both residual heat removal trains will be operable in Modes 5 and 6 under certain operating conditions. Technical Specifications only require one operable train of

residual heat removal in Mode 5 (with reactor coolant system loops filled) or in Mode 6 (with refueling cavity water level greater than 23 feet above the reactor flange).

Following an evaluation, the licensee determined that heavy loads had been moved over portions of a single operable residual heat removal train during Modes 5 and 6. The licensee's procedure to control heavy load lifts is Procedure MDP-ZZ-MH004, "Control of Heavy Loads and Special Lifting Devices," Revision 16. The licensee considered this condition to be outside the design basis for the plant and that the heavy load analysis was inconsistent with Technical Specifications although more restrictive.

The licensee revised the heavy loads program to alert crane operators and outage coordinators of this issue. In addition, training materials will be revised prior to the October 1999 refueling outage. The inspectors confirmed that these training initiatives were ongoing and included in the training schedule.

Subsequent to revising the heavy loads program, movement of heavy loads over the residual heat removal system in Modes 5 and 6 were effectively prevented. The licensee submitted an amended response to Generic Letter 81-07, "Control of Heavy Loads," on July 22, 1999. This response was intended to eliminate the inconsistency between the generic letter initial submittal and the Technical Specifications.

The inspectors determined that the licensee's heavy loads procedure was inadequate in that it allowed heavy load lifts over trains of the residual heat removal system. The failure to adequately control the heavy loads procedure constitutes a violation of 10 CFR Part 50, Appendix B, Criterion V. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Suggestion-Occurrence-Solution Report 98-3225 (50-483/99008-01).

#### **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.

## **R4 Staff Knowledge and Performance**

### **R4.1 New Fuel Receipt Radiological Protection Practices**

#### **a. Inspection Scope (71750)**

On August 25 and September 1, 1999, the inspectors observed health physics control and oversight of new fuel receipt inspection activities. Tasks observed included the contamination and radiation surveys of newly exposed surfaces.

#### **b. Observations and Findings**

The inspectors observed health physics technicians perform swipe surveys of the inside of the new fuel container lids and of the surfaces of the plastic covered new fuel assemblies prior to removing their plastic covering. The technicians met the requirements of Procedure OTS-KE-00003, "Unloading and Storage of New Fuel Assemblies and Fuel Inserts," Revision 18. The inspectors noted that health physics personnel who performed the radiological surveys, as well as operators involved in the evolution, demonstrated good ALARA practices and were knowledgeable of Procedure OTS-KE-00003.

#### **c. Conclusions**

During the performance of swipe surveys associated with new fuel receipt inspection, health physics technicians and operators demonstrated good ALARA practices and were knowledgeable of radiological requirements.

## **S2 Status of Security Facilities and Equipment**

### **S2.1 Control of Vehicles in the Protected Area**

#### **a. Inspection Scope (71750)**

The inspectors performed a walkdown of the protected area to assess the licensee's compliance with the security plan.

#### **b. Observations and Findings**

On July 31, 1999, at approximately 9:55 a.m., the inspectors found an unattended vehicle in the protected area that had its keys left in the ignition. The inspectors promptly reported this condition to a nearby security guard. The licensee took immediate corrective action by informing the security alarm station and dispatching an operator who removed the keys from the vehicle.

License Condition 2.E of the licensee's facility operating license requires, in part, that the licensee maintain in effect and fully implement all provisions of the NRC approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p) and 10 CFR 50.90.

Section 1.6.2 of the licensee's security plan requires that "While inside the Protected Area, unattended vehicles, with the exception of unlicensed, specialized, or slow moving equipment shall have their ignition keys removed."

The licensee's failure to control vehicles within the protected area is a violation of Section 1.6.2 of the security plan. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Suggestion-Occurrence-Solution Report 99-1504 (50-483/99008-02).

c. Conclusions

The licensee's failure to control vehicles within the protected area is a violation of Section 1.6.2 of the security plan. This Severity Level IV violation is being treated as a noncited violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Suggestion-Occurrence-Solution Report 99-1504.

## **V. Management Meetings**

### **X1 Exit Meeting Summary**

The exit meeting was conducted on September 7, 1999. 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  
J. D. Blosser, Manager, Operations Support  
H. D. Bono, Supervising Engineer, Quality Assurance Regulatory Support  
G. J. Czeschin, Superintendent, Training  
M. S. Evans, Superintendent, Emergency Preparedness  
R. E. Farnam, Supervisor, Health Physics, Operations  
J. M. Gloe, Superintendent, Maintenance  
P. R. Heiberger, Superintendent, Instrument and Control  
D. S. Hollabaugh, Superintendent, Design Engineering  
J. V. Laux, Manager Quality Assurance  
T. A. Moser, Superintendent, Systems Engineering  
J. T. Patterson, Superintendent, Work Control (Acting)  
J. R. Peevy, Manager, Emergency Preparedness  
G. L. Randolph, Vice President and Chief Nuclear Officer  
M. A. Reidmeyer, Senior Engineer, Quality Assurance Regulatory Support  
R. R. Roselius, Superintendent, Radiation Protection and Chemistry  
L. S. Sandbothe, Superintendent, Operations  
T. P. Sharkey, Supervising Engineer, Systems Engineering  
M. E. Taylor, Manager, Nuclear Engineering  
W. A. Witt, Assistant Manager, Callaway Plant

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 |
| 92903 | Followup - Engineering  |

ITEMS OPENED AND CLOSED

Opened

|          |     |   |
|----------|-----|---|
| 98008-01 | NCV | Failure to adequately control the heavy loads procedure (Section E8.1). |
| 98008-02 | NCV | Failure to control vehicles within the protected area (Section S2.1).   |

Closed

|          |     |   |
|----------|-----|---|
| 98008-01 | NCV | Failure to adequately control the heavy loads procedure (Section E8.1). |
| 98008-02 | NCV | Failure to control vehicles within the protected area (Section S2.1).   |