

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/84-21(DRP)

Docket No. 50-483

License No. NFP-25

Licensee: Union Electric Company  
Post Office Box 149 - Mail Code 400  
St. Louis, MO 63166

Facility Name: Callaway Plant, Unit 1

Inspection At: Callaway Site, Steedman, MO

Inspection Conducted: May 16 through June 30, 1984

Inspector: B. H. Little

Approved By: *P.R. Pelke for*  
W. L. Forney, Chief  
Projects Section 1A

*7/25/84*  
Date

Inspection Summary

Inspection on May 16 through June 30, 1984 (Report No. 50-483/84-21(DRP))

Areas Inspected: Routine inspection by the Senior Resident Inspector, including Safety Evaluation Report Items, licensee events, Callaway Plant License issuance, Quality Assurance for the Startup Test Program, initial fuel load witnessing, Region III tours and plant tours. This inspection involved a total of 218 inspector-hours onsite by one NRC inspector including 54 inspector-hours during off-shifts.

Results: Of the seven areas inspected, no items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

- \*S. E. Miltenberger, Manager, Callaway Plant
- \*D. F. Schnell, Vice President - Nuclear
- \*C. Naslund, Superintendent Startup
  - J. V. Laux, Supervisor OA Startup
  - C. A. Brewer, Test Program Coordinator
- \*A. P. Neuhalfen, Assistant Manager - Operations and Maintenance
- \*M. E. Taylor, Operations Superintendent
  - R. H. Leuther, Maintenance Superintendent
- \*J. E. Davis, Compliance Superintendent
  - K. L. Wickes, Instrument and Control Supervisor
- \*J. C. Gearhart, Supervisory Engineer - QA
- \*D. L. Poole, Advisor to Manager
- \*R. L. Powers, Assistant Manager, Quality Assurance
- \*G. L. Randolph, Assistant Manager, Technical Services
- \*W. R. Robinson, Supervisor, Compliance
- \*W. H. Sheppard, Assistant Superintendent, Startup

\*Denotes those present at one or more exit interviews.

In addition, a number of equipment operators, NRC-licensed Reactor Operators and Senior Reactor Operators, and other members of the Operations and Maintenance staffs were contacted.

### 2. Inspection of Safety Evaluation Report (SER) Items

#### (Closed) SER Item (483/83-32-06)

<u>Description</u>	<u>SER Section</u>	<u>Page</u>
Control room ventilation systems are in accordance with Regulatory Guide 1.52	6.4	6-26

During the review of this matter the inspector found that the review and evaluation of the Callaway control room ventilation systems design had been performed by the NRR staff. The staff found that the design of this system was acceptable with respect to Regulatory Guide 1.52. This review is documented in SER Section 6.5.1.2. This item is considered to be closed.

#### (Closed) SER Item (483/84-20-05)

<u>Description</u>	<u>SER Section</u>	<u>Page</u>
Remove Conduit	SER Supplement 3 22.I.D.1	22-4

This item was identified as a human engineering discrepancy within the auxiliary shutdown panel (ASP) room, which was reported in the Detailed Control Room Design Review Summary Report.

NRR was advised by the licensee in letter ULNRC-822, dated May 15, 1984, that the conduit would not be relocated based on inspections and operator training on the completed ASP which indicated that the conduit did not constitute an operational problem.

The licensee was advised by an NRR letter dated June 11, 1984, that the NRR staff determined that the conduit need not be removed. This item is considered to be closed.

### 3. Inspection of Licensee Events

#### a. Water Spill in the Reactor Containment Building

On May 6, 1984, while filling the Emergency Core Cooling System (ECCS) pump suction headers, approximately 42,000 gallons of water leaked from the ECCS pump suction header to the containment recirculation sump, overflowing the sump onto the containment floor. The licensee documented the event in Incident Report No. 84-194.

The apparent cause was failure to establish a water tight boundary for the filling and venting of the ECCS suction header. A boundary valve (BN 8812B) was found to be approximately 5% open which permitted water to flow from the Refueling Water Storage Tank through the ECCS suction header into the containment sump. The licensee attributed the partially opened valve to ongoing maintenance work involving the replacement of the valve actuator. The valve was used as a boundary prior to completing post maintenance checks.

The inspector interviewed licensee operating and maintenance personnel, reviewed the incident report and related documentation such as work instructions, tag and valve line-up sheets, and the licensee's corrective action. The licensee's corrective action included:

- (1) Issuance of a Callaway modification request to lower the containment sump level alarm set point to alert operators of an abnormal level prior to filling the sump.
- (2) Revised Plant Procedure APA-ZZ-00310, "Workman's Protection Assurance and Caution Tagging". The procedure now provides for retest/post maintenance checks and sequencing of items (valving order) as they are positioned or restored.

The inspector is satisfied that the event was appropriately documented, evaluated and that the licensee's corrective action was adequate to prevent recurrence.

b. Operational Events Resulting in the Loss of Residual Heat Removal (RHR) Pump Suction, Inadvertent Safety Injection System Actuation Signals and Overfilling of the Ultimate Heat Sink

During the period June 1-3, 1984, five unplanned events occurred at the Callaway Plant while the licensee was performing surveillance tests in preparation for fuel load. The events are listed in the order of occurrence.

- (1) At 5:35 p.m. on June 1, 1984, the RHR pump suction valves (8701A/B) closed during pump operation. The reactor operator promptly (within 15 seconds) tripped off both RHR pumps. Subsequent pump operation indicated that no apparent pump damage had occurred. The licensee's investigation revealed that a test switch on the "Breakout Box" being used by I & C technicians was in the wrong position which caused an output voltage spike which actuated the high pressure closing bistable for the valves (8701A/B).
- (2) At 9:30 p.m. on June 2, 1984, the plant received a train "A" Safety Injection (SI) signal. Because of the plant status, the pumps and emergency diesel generator were disabled and did not start. However, valves were actuated and stroked to their SI positions. The event was initiated by I & C technicians (during troubleshooting activities) performing procedure steps out of sequence which resulted in the SI actuation signal.
- (3) At 9:40 p.m. on June 2, 1984, a train "B" SI signal was initiated by a control room operator while attempting to reset the above train "A" SI signal. The operator pushed the manual reset which removed the low pressure (steamline and pressurizer) blocks. The SI signal was generated because the plant was in a low pressure condition at the time.
- (4) At 1:30 a.m. on June 3, 1984, the Ultimate Heat Sink was overfilled. This event resulted from the above safety injection signals which realigned valves in the general service water and essential service water systems allowing cooling tower basin water to discharge into and overflow the Ultimate Heat Sink. The operators failed to close the valves during system restoration after clearing the SI signal.
- (5) At 4:45 a.m. on June 3, 1984, a SI signal was generated similar to event (2) above. I & C personnel involved in troubleshooting the Reactor Protection System using the surveillance procedure decided to exit the procedure. In the process of exiting the procedure, the I & C personnel went directly to the Restoration Section of the procedure, which is written in a manner assuming all steps have been performed in the prescribed sequence. They should have used a step in the Precautions and Limitation Section

that describes the exit procedure if such action is required without total completion. This resulted in a condition that removed the BLOCKS for the Low Steamline Pressure and Low Pressurizer Pressure SI Actuation Logics. Since these conditions actually existed in the plant, the SI was actuated.

On June 3, 1984, the inspector arrived onsite following licensee notification of the above events. On arrival the inspector found that the Callaway Plant Management and staff were actively involved in the evaluation of the causal factors and corrective actions relating to the events. The events were reported to NRC Region III and NRR by licensee letter ULNRC-840 dated June 4, 1984. The licensee had suspended control room activities relating to post fuel load work and temporary plant modifications and had assigned the Senior Operations Advisory Panel (SOAP) to investigate the events.

The licensee determined that the events were caused by a combination of:

- . Personnel error - Failure to precisely follow procedures.
- . Procedural deficiencies - Insufficient or inadequate guidance or inadequate caution statements.
- . Lack of system familiarization - Indications misinterpreted or unawareness.
- . Mental fatigue - Long working hours and hectic work pace created an environment conducive to mental errors.
- . Test hardware design - The test switches are easily switched by unintended actions and not readily detectable.

Licensee action to prevent recurrence included:

- . The indoctrination of personnel in procedural discipline and a review of the events for lessons learned.
- . A detailed review/revision of I & C Procedures prior to field use.
- . Implemented operating procedures "SI Actuation Recovery Check List" and "Watchstation Equipment Logs and Practices".
- . Reduction of control room activities.
- . Increased support in the I & C Departments.
- . Restriction on working hours.

The inspector has reviewed in detail the events, causal factors and the licensee's corrective action. The inspector found that the licensee promptly identified, reported and thoroughly evaluated the events and took appropriate corrective action to prevent recurrence.

#### 4. Callaway Plant License

On June 11, 1984, the NRC issued the Callaway Plant Unit 1 Operating License (NFP-25). Subsequent to the issuance of the license, the licensee advised the inspector of two license issues as follows:

- a. On June 28, 1984, the licensee (Assistant Manager QA) notified the inspector that a change was made in the reporting relationship of the QA Training Supervisor. This change was made without obtaining NRC approval. The previous relationship as shown in Figure 6.2.1 of the Callaway Technical Specification, indicated that the QA Training Supervisor was located offsite reporting to the Superintendent Quality Engineering. This position should have been shown as an onsite function. The change implemented on June 15, 1984, resulted in the supervisor reporting to the onsite Assistant Manager QA.

In review of this matter the inspector found that an appropriate FSAR change had been initiated and the licensee has issued a formal change request to change the Technical Specification. The licensee also issued a Request for Corrective Action (RCA) to the Manager QA on June 29, 1984, to document the failure to obtain prior NRC approval of the change.

The inspector discussed this matter with NRC Region III and NRR (licensing) on June 28, 1984. NRC determined that the change was minor (did not represent a change in scope of the individual or department responsibilities), and that a notice of violation would not be issued.

- b. The licensee requested clarification of Item "F" of Attachment 1 to Callaway Plant Operating License NPF-25. This item states, "The licensee shall install a permanent area monitor on the manipulator crane prior to the entering Mode 6 (refueling mode)."

Clarification was needed because Mode 6 also applies to initial fuel load activities. This matter was discussed between Region III personnel (W. Forney and B. Little) and Region III/NRR personnel (B. Little and J. Holonich) to reach agreement as to the intent of this license requirement. This matter was also discussed in a separate phone conversation between Region III personnel (C. Norelius, W. Forney and B. Little).

Agreement was reached that the intent of Item "F", of Attachment 1, is to require the licensee to install a permanent area monitor (to replace the temporary area monitor) on the manipulator crane prior to entering Mode 6 for the first refueling outage.

The inspector advised the licensee of the NRC's position in this matter.

No items of noncompliance or deviations were identified.

5. Quality Assurance for the Startup Test Program

An inspection of the licensee's QA program was performed to ascertain that a program has been developed and implemented to cover the startup and power ascension test program. This inspection included a review of Section 17 of the FSAR (operations QA program), interviews with QA personnel, generic surveillance procedures, QA checklists and surveillance reports.

The inspector found that the licensee's QA Department has developed and implemented a comprehensive QA surveillance program for the initial startup test program. The program was implemented prior to initial fuel load and provides for:

- . Field observations of tests and plant evolutions.
- . Review of test data.
- . Evaluation of test objectives and acceptance criteria.
- . Test package results review.

The above QA surveillance activities are documented on generic checklists and system specific checklists. The inspections are now being performed by two QA engineers assigned to each shift providing 24 hour per day coverage. Surveillance reports are issued for each scheduled surveillance activity. These reports are submitted to the appropriate department heads and the Plant Manager.

This inspection included a review of seven surveillance reports and the related checklists and "Requests for Corrective Action" (RCAs).

The inspector also reviewed six additional checklists scheduled for future activities. Based on this review, the inspector is satisfied that the licensee has implemented an effective QA surveillance program for startup activities and that the identified deficiencies are being documented, tracked, and responded to by the appropriate departments.

No items of noncompliance or deviations were identified.

6. Initial Fuel Load Witnessing

An inspection of initial fuel load activities was performed to ascertain licensee conformance to license requirements, and to observe plant equipment and operating staff performance. This inspection included a review of the Initial Core Loading Procedure (ETT-ZZ-07010), Initial Count Ratio

Monitoring Procedure (ETT-ZZ-07020), referenced prerequisite procedures, and checklists. Daily observations were made to verify applicable Technical Specification conformance, and to observe fuel load activities and operating crew performance. The inspection also included daily reviews of shift turnovers, status boards, logs and fuel load data. Additional inspections were performed in this area by the Senior Resident Inspector (construction) and NRC Region III Management and staff.

The inspector observed fuel load activities for the first two fuel assemblies containing the primary sources and the last seven fuel assemblies. Operating crew performance was observed in the fuel building, reactor containment and control room.

Through inplant inspections, review of calibration data and observation of chemical analysis and plant records the inspector verified the following prerequisites were satisfied for entry into Mode 6 (initial fuel load).

- . All deficiencies identified on the licensee's master tracking system as fuel load restraints had been corrected.
- . Clean work areas and personnel access controls had been established in accordance with procedure APA-ZZ-00370 (housekeeping and cleanliness control).
- . Reactor cooling system water and level temperature quality was within specification.
- . The nuclear monitoring station was established providing plant and temporary nuclear instrumentation, voice communications with refueling machine and control room, recording equipment and status boards.
- . An approved radiation work permit had been issued for the fuel elements containing primary sources.
- . Technical Specification 3.1.2.1 (Boron Injection Flow Path).
- . Technical Specification 3.1.2.1 (Charging Pump Operability).
- . Technical Specification 3.1.2.5 (Borated Water Source - Shutdown).
- . Technical Specification 3.8.1.2 (Electrical AC Sources).
- . Technical Specification 3.9.2 (Neutron Flux Monitoring Instrumentation).
- . Technical Specification 3.9.4 (Containment Building Penetrations).
- . Technical Specification 3.9.5 (Communications).



The inspector performed frequent inplant inspections during fuel load operations. The inspector verified that refueling status boards and operating logs were being maintained current, that sampling and analysis was being performed at the required frequency, and that neutron monitoring instruments were being continually monitored and operating satisfactorily. The inspector also reviewed operating logs to ascertain that deficiencies identified were appropriately documented and reported. The inspector observed control room and refueling station shift turnovers.

The inspector determined that the fuel loading activities were performed in accordance with licensee procedures, the licensee exercised effective supervision and controls, and activities were accomplished in a disciplined manner. With one exception, all deficiencies identified during fueling operations were found and documented by the licensee. On June 13, 1984, the NRC Region III inspectors observed that troubleshooting of fuel handling equipment in the fuel building using a dummy fuel assembly was being performed without having an appropriate work authorization. The licensee was advised of this matter and took prompt corrective action. The action included the assignment of a supervisor to the fuel building and the indoctrination of personnel. The inspector noted that during subsequent troubleshooting, appropriate work authorizations and procedures were utilized.

Problems with fuel handling equipment occurred a number of times during fuel handling operations. Most related to electrical controls and interlocks. The licensee is evaluating this matter and has documented the equipment deficiencies on Incident Reports. The inspector's final review of this matter will be documented in a subsequent inspection report, and is assigned Open Item No. 483/84-21-01(DRP).

The licensee video taped the final core configuration. NRC Region III Inspectors reviewed the video tape and verified that the final core configuration is as described in WACP-10249.

No items of noncompliance or deviations were identified.

#### 7. NRC Region III Tours

On June 14, 1984, the Senior Resident Inspectors accompanied the NRC Region III Administrator and members of his staff during a site visit. The visit was performed to assess the operational readiness of the Callaway Plant and personnel. The visit included inplant tours, observation of fuel load activities within the fuel building and reactor containment, and interviews with licensee management, staff and operating personnel.

Plant conditions and fuel loading activities appeared satisfactory. Plant personnel at all levels displayed a positive attitude toward plant and personnel readiness for operation. During interviews Region III stressed the importance of a conservative operating philosophy and the need for a deliberate and disciplined approach to operations.

No items of noncompliance or deviations were identified.

8. Plant Tours

The inspector toured site and plant areas frequently during this inspection period to observe housekeeping conditions and practices, ongoing preparations/fuel load activities, maintenance and testing activities. The inspector reviewed control room logs and observed shift turnovers.

No items of noncompliance or deviations were identified.

9. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during the inspection is discussed in Paragraph 6.

10. Exit Interview

The inspector met with licensee representatives (denoted under Persons Contacted) at intervals during the inspection period. The inspector summarized the scope and findings of the inspection. The licensee representatives acknowledged the findings as reported herein.