

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/90019(DRP)

Docket No. 50-483

License No. NPF-30

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, Missouri

Inspection Conducted: October 1 through November 15, 1990

Inspectors: B. L. Bartlett  
C. H. Brown  
W. B. Grant

Approved By:

*J. W. McCormick-Barger*  
J. W. McCormick-Barger, Acting Chief  
Reactor Projects Section 3C

*12/6/90*  
Date

Inspection Summary

Inspection from October 1 through November 15, 1990 (Report No. 50-483/90019(DRP))

Areas Inspected: Routine unannounced safety inspections of onsite follow up of events, seismic instrumentation, plant operations, maintenance/surveillance, and allegation follow up were performed.

Results: Of the areas inspected, one violation was identified for failure to properly seal a fire barrier penetration (paragraph 4.g.). For this inspection period the area of plant operations appeared to be well implemented. The refueling outage stressed operations, yet it continued to function smoothly. In the area of maintenance/surveillance, a weakness was noted in workers' use and signing of procedures. This weakness was also observed by members of an NRC Maintenance Team Inspection. In the area of safety assessment/quality verification, the Quality Assurance and Quality Control organizations appeared to be performing well and identified significant issues in a timely manner. The areas of security, emergency preparedness, and radiological controls continued to be well executed.

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## DETAILS

### 1. Persons Contacted

- D. F. Schnell, Senior Vice President, Nuclear
- G. L. Randolph, General Manager, Nuclear Operations
- \*J. D. Blrsson, Manager, Calloway Plant
- \*C. D. Naslund, Manager, Operations Support
- \*J. V. Laux, Manager, Quality Assurance
- J. R. Peevy, Assistant Manager, Operations and Maintenance
- W. R. Campbell, Manager, Nuclear Engineering
- M. E. Taylor, Assistant Manager, Work Control
- D. E. Young, Superintendent, Operations
- R. K. Roselius, Superintendent, Health Physics
- T. P. Sharkey, Supervising Engineer, Site Licensing
- G. J. Czeschin, Superintendent, Planning and Scheduling
- G. R. Pendegraff, Superintendent, Security
- L. H. Kanuckel, Supervisor, Quality Assurance Program
- \*G. A. Hughes, Supervisor, Independent Safety Engineer Group
- J. C. Gearhart, Superintendent, Operations Support, Quality Assurance
- \*C. S. Petzel, Quality Assurance Engineer
- \*J. A. McGraw, Superintendent, Design Control

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

In addition, a number of equipment operators, reactor operators, senior reactor operators, and other members of the quality control, operations, maintenance, health physics, and engineering staffs were contacted.

### 2. On Site Follow Up (92700)

- a. On October 24, 1990, the licensee issued Special Report 90-02, "Invalid Diesel Generator Failure Due to Improper Output Breaker Plunger Clearance." The licensee was performing a scheduled surveillance of the emergency power system "B" train when the following sequence of events occurred:
  - The station blackout with safety injection (SI test was successfully performed. This required use of a test link which was then removed.
  - The station blackout without SI test was initiated.
  - Loads were automatically shed from "B" safeguards bus (NB02).
  - The "B" diesel generator (D/G) started, achieved the required voltage and frequency, and then closed onto and energized bus NB02.

- No loads auto sequenced onto the bus. Manual loading was still operable and was used to ensure an adequate supply of cooling water to the D/G.

The licensee determined that a plunger bolt in the D/G output breaker cubicle, which actuates a stationary auxiliary switch (152 S contact), was out of adjustment. The plunger bolt was adjusted and the test successfully performed. The licensee had experienced an identical failure of the plunger bolt in April of 1986 (Special Report 86-01). The root cause could not be identified at that time and the preventative maintenance inspection frequency was increased. Following the new failure, an evaluation determined that the test link used for the station blackout with SI was too long and had bent a plunger clip, lowering the plunger bolt far enough to prevent actuating the 152 S contact. The problem with the test link was traced to a breaker manufacturer's error. The licensee's 10 CFR Part 21 evaluation is on-going.

In Special Report 90-02, the licensee classified the failure to sequence loads as an invalid failure. The inspectors agreed with this conclusion but disagreed with the licensee's use of paragraph c.2.e.4 of Regulatory Guide 1.108 as justification. The licensee's contention was that the test was a successful start that was terminated intentionally. However, it was in fact a successful start followed by an unsuccessful loading attempt. This would normally be considered a valid failure; however, it met the test of paragraph c.2.e.2. In other words, the part that failed was not a part of the defined diesel generator unit design. The licensee subsequently revised Special Report 90-02.

- b. On October 12, 1990, at 10:34 a.m. (CDT) there was an apparent explosion in breaker PA0108. This is the 13.8 KV supply to reactor coolant pump (RCP) "B". At the time, the plant was in a refueling evolution with the reactor vessel defueled. As part of the regular preventive maintenance program (PM), RCP "B" motor had been removed and replaced with a spare. During this evolution, the PM was also performed on breaker PA0108. When the apparent explosion occurred, the new motor was uncoupled for a routine "bump". The plant fire brigade responded to the report of a fire in bus PA01 (north end of the 2033 foot elevation of the turbine building); however, there was only residual smoke in the air and no actual fire other than the initial flash. When the back panel of the breaker cubicle was removed, the licensee identified that ground straps had not been removed. The licensee performed a high voltage test on the motor leads between the motor and breaker, electrically checked the motor, rotated the motor by hand, repaired the damaged portions of the bus connections, checked the adjacent breakers, performed a visual and infrared inspection of the startup transformer, and bumped the motor. All equipment was found to be operating properly and to be in good condition. The licensee determined that the ground straps were left in the cubicle after maintenance due to inadequate programmatic controls on grounding connections.

No violations or deviations were identified in this this area.

3. Seismic Instrumentation (71707)

Inspection Module 71707, revised October 4, 1990, requires, in part, that inspectors must observe seismic monitoring instrumentation operability tests at least once per SALP cycle. The tests observed by the inspectors are listed in paragraph 5, surveillance.

Seismic loading for plant equipment is considered for earthquakes of two magnitudes, the operating basis earthquake (OBE) and the safe shutdown earthquake (SSE). The maximum horizontal ground acceleration for the OBE is 0.12g, and for the SSE is 0.20g. Those structures, components, and systems necessary to ensure safe shutdown of the unit are designated Seismic Category I. Seismic instrumentation (System SG) has been installed by the licensee in order to monitor the effects of earthquakes at the plant site and to collect data needed to evaluate the safety impact of an earthquake on Seismic Category I equipment.

The licensee has installed three instrumentation systems for the detection and recording of earthquakes:

- a. Triaxial strong motion accelerometers (SMA) are installed at various locations in Seismic Category I structures. The SMAs provide data on the frequency, amplitude, and phase relationship of the structures' seismic response. The SMS system records on magnetic tape through a central nine channel digital cassette recording device.
- b. Peak recording acceleographs (PRA) are installed at various locations in Seismic Category I structures. The PRAs consist of a permanent magnetic stylus on a torsional accelerometer of known sensitivity (0.1 inch equals plus or minus 1 g), recording on a 0.25 inch wide magnetic tape.
- c. A passive response spectrum recorder (PRSR) is located on the containment building base slab. The PRSR records spectral accelerations at specified frequencies.

The SMAs and the PRSR provide control room annunciation upon actuation.

The inspectors observed calibration of response spectrum analyzer which takes data from the SMAs and one PRA. The licensee determined that the response spectrum analyzer was within calibration. During the calibration of the PRA, the Health Physics (HP) Department attempted to decontaminate the unit. The PRA is a delicate instrument and the HP technician apparently knocked it out of calibration. While this did not damage the data stored on the magnetic tape, it would have prevented an accurate "as-found" condition from being determined following an actual event. In all other aspects, the seismic monitoring system was found to be operable, calibrated, and well maintained.

No violations or deviations were identified in this area.

#### 4. Plant Operations (71707)

##### a. Operational Safety Verification

Inspections were routinely performed to ensure that the licensee conducted activities at the facility safely and in conformance with regulatory requirements. The inspections focused on the implementation and overall effectiveness of the licensee's control of operating activities, and on the performance of licensed and non-licensed operators and shift technical advisors. The inspections included direct observation of activities, tours of the facility, interviews and discussions with licensee personnel, independent verification of safety system status and limiting conditions of operation (LCO), and reviews of facility procedures, records, and reports. The following items were considered during these inspections:

- Adequacy of plant staffing and supervision.
- Control room professionalism, including procedure adherence, operator attentiveness, and response to alarms, events, and off-normal conditions.
- Operability of selected safety-related systems, including attendant alarms, instrumentation, and controls.
- Maintenance of quality records and reports.

The inspectors observed that control room supervisors, shift technical advisors, and operators were attentive to plant conditions, performed frequent panel walkdowns, and were responsive to off-normal alarms and conditions.

##### b. Off-shift Inspection of Control Room

The inspectors performed routine inspections of the control room during off-shift and weekend periods, including inspections between the hours of 10:00 p.m. and 5:00 a.m. The inspections were conducted to assess overall crew performance and, specifically, control room operator attentiveness during night shifts.

The inspectors determined that both licensed and non-licensed operators were attentive to their duties, and that the administrative controls relating to the conduct of operation were being adhered to.

##### c. Plant Material Conditions/Housekeeping

The inspectors performed routine plant tours to assess material conditions within the plant, ongoing quality activities, and plantwide housekeeping.

##### d. Radiological Controls

The licensee's radiological controls and practices were routinely observed by the inspectors during plant tours and during the

inspection of selected work activities. The inspection included direct observations of health physics (HP) activities relating to radiological surveys and monitoring, maintenance of radiological control signs and barriers, and contamination and radioactive waste controls. The inspection also included a routine review of the licensee's radiological and water chemistry control records and reports.

e. Security

Each week during routine activities or tours, the inspectors monitored the licensee's security program to ensure that observed actions were being implemented according to their approved security plan. The inspectors noted that persons within the protected area displayed proper photo-identification badges and those individuals requiring escorts were properly escorted. The inspectors also verified that checked vital areas were locked and alarmed. Additionally, the inspectors also verified that observed personnel and packages entering the protected area were searched by appropriate equipment or by hand.

- f. During this report period, the licensee completed their refueling outage and returned the unit to Mode 1 (power operations). The NRC inspectors observed the licensee's fuel movement during the outage. The evolution was conducted in a safe, methodical, and professional manner. Only one event of note occurred. On October 18, 1990, at 10:00 a.m. (CDT), the refueling machine gripper improperly engaged fuel assembly G32 at its top nozzle hold down springs. This was discovered after the fuel assembly had been picked up from the transfer cart and moved to its core position. The vertical level indicator indicated that the fuel assembly could not be fully lowered. The licensee placed G32 in a storage location and investigated the problem. An underwater diver replaced the gripper assembly with a new gripper. The licensee determined that G32 was not damaged and that the gripper design allows the gripper to be engaged before it is at the proper elevation. The licensee is evaluating hardware and program changes to prevent recurrence.
- g. On November 1, 1990, during a routine tour of the auxiliary feedwater pump rooms, the NRC inspectors identified an open one and one half inch conduit. The conduit penetrated the three hour fire barrier separating fire area A.14 (motor driven auxiliary feedwater pump room A) and fire area A.15 (turbine driven auxiliary feedwater pump room). APA-ZZ-00703, Revision 1, "Fire Protection Operability Criteria and Surveillance Requirements," Attachment 6, page 1, requires, in part, that all fire barriers . . . separating safety related fire areas . . . and all sealing devices in fire rated assembly penetrations . . . shall be operable at all times." Bechtel Drawing M-0Y003, Revision 1, "Conduit Fire Stop/Smoke and Gas Seal," item I.1.A, requires that "all conduits four inches diameter and smaller that penetrate a fire zone boundary wall or floor shall be sealed with a fire stop/smoke and gas seal at the penetration or at both ends of the conduit." The shift supervisor was notified and fire watches were established until the conduit was capped. The failure to seal the conduit is a violation (483/90019-01).

The licensee's engineering personnel stated that although drawing M-OY003, Revision 1, "Conduit Fire Stop/Smoke and Gas Seal" requires all conduits four inches and smaller to have a fire stop/smoke and gas seal at fire barrier penetrations, failure to do so in this example was not a significant safety issue. The licensee had previously participated in a fire test program that showed that a one and one half inch conduit which extends one foot or greater from the fire barrier does not need an internal seal to maintain the three hour fire rating of the barrier. The conduit that was found unsealed extended one foot into fire area A.15 and six feet into fire area A.14. In addition, the fire test was performed with a fire loading equal to 240,000 BTUs per square foot, while the fire loading for fire area A.14 is 1350 BTUs per square foot and fire area A.15 is 600 BTUs per square foot.

The NRC inspectors' conclusion is that, while there was an apparent violation of the licensee's fire protection program, a fire would not have disabled both pumps and the plant's ability to achieve and maintain safe shutdown was not affected. However, this apparent violation represents a potential programmatic concern that must be addressed by the licensee.

One violation was identified in Section 4g.

5. Maintenance/Surveillance (62703) (61726)

Selected portions of the plant surveillance, test, and maintenance activities on safety-related systems and components were observed or reviewed to ascertain that the activities were performed in accordance with approved procedures, regulatory guides, industry codes and standards, and the Technical Specifications. The following items were considered during these inspections: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning the components or systems to service; parts and materials that were used were properly certified; and appropriate fire prevention, radiological, and housekeeping conditions were maintained.

a. Maintenance

The reviewed maintenance activities included:

<u>Work Request No.</u>	<u>Activity</u>
S458015	Diesel generator KKJ01B - tear down and inspection.
W129390	Valve BN LCV-0112E charging pump "B" suction from refueling water storage tank - ensure terminal points and wires are correctly numbered.

<u>Work Request No.</u>	<u>Activity</u>
W127403	Control building air conditioner SGK05B - remove end bells on heat exchanger and inspect protective coating.
W129011	Replace manual isolation valve to SGK05B - compressor discharge.
W128609	Inspect/repair valve EF HV-0041 internals.
C472465	Implement Callaway Modification Package (CMP) 89-1043 - "B" containment cooler drip pan modification.
A467545	Install new reactor vessel half-loop level indicator per CMP 88-1040.
W477576	Valve EG HV-0015 - repair valve seat leak-by.
W138008	Valve EF-HV-130 - repair valve seat leak-by.
W131137	Reactor coolant pump motor "D" - perform hi-pot of capacitors.
P456075	Breaker PG1207 - perform annual preventive maintenance.
W133346	Valve EF HV-0031, repair valve seat internals, local leak rate test leakage in excess of 0.6 La.
W485153	Replace power supplies, P53, 15 volt DC in SA036C.
W480576	Replace the "N" four way slide assembly (standby side) for "B" main steam isolation valve.
W486582	Correct red train hydraulic pump up problem on steam generator "B" feedwater isolation valve.

During the review of W477576, the inspectors noted that steps had not been signed off as completed even though quality control (QC) had signed off and the step had in fact been done. The lead mechanic stated that the lead had observed that the sign off had been missed by the night crew and the lead would request that the blanks be signed off that night. During a further review of another procedure in the package (valve repacking procedure MDP-ZZ-P00001), the inspectors identified that even though the valve was being reinstalled in the system, only the prerequisites had been signed off. During the review of W138008, the



inspectors noted that the workers had a copy of the procedure but did not have it out. In addition, they did not have their work request with them. During the review of W131137, the inspectors noted that the workers knew their work request number, but did not have any documentation with them.

The three examples noted above indicate that maintenance workers have a casual attitude towards signing off procedure steps. It should be noted, however, that there were no identified instances of a failure to follow the procedure. Licensee management was informed of the inspectors' concern that casual use of procedures could eventually result in improper maintenance.

b. Surveillance

The reviewed surveillances included:

<u>Procedure No.</u>	<u>Activity</u>
ISL-AB-OP514	Loop calibration of steam generator "A" pressure.
ISL-SE-00N43	Retest (R473508C) for CMP 89-1030, installation of new digital nuclear instrumentation for upper and lower detectors.
R469304C	Following CMP 89-1049, deletion of negative rate flux trip.
S475737	Perform 10 year inservice inspection hydro of BG-H1004.
ISL-SG-00A58	Loop calibration of the seismic response spectrum system.
ISL-SG-00AR8	Loop calibration of the steam generator "C" support peak-recording accelerometers.
ISL-SE-00N35	Loop - nuclear, nuclear instrumentation internal range N35.
ITL-GT-OPD40	Loop - pressure, containment/auxiliary building differential pressure.
ITM-ZZ-00016	Sorenson power supply ripple voltage measurement.
ISL-SQ-00Y64	Loop - vibration; loose parts monitor.
OSP-AC-00008	Turbine valve tightness test.
OSP-SF-00002	Control rod movement test.

ETP-ZZ-ST003	Determination of low power physics testing range.
ETP-ZZ-ST005	Bank reactivity worth measurement.
OSP-ZZ-00001	Control room shift and daily log readings and channel checks.
ETP-ZZ-ST002	Initial criticality.
ISF-SE-00N36	Functional check of intermediate range channel N36.

The NRC inspectors observed the licensee's preparations for, and approach to, criticality following the refueling outage. All personnel followed the procedures in a safe and efficient manner. The estimated critical position and the actual critical position agreed within 20 ppm.

No violations or deviations were identified in this area.

#### 6. Allegation Followup

Discussed below are allegations regarding the radiation program at Callaway Station. The allegations were evaluated during this inspection including telephone contact with the alleged to obtain more specific information, reviews of applicable procedures and records, and interviews with licensee and contractor personnel. The allegations are discussed below.

##### Allegation: (AMS No. R111-90-A-0085):

Concern No. 1: The alleged stated that he was not given a whole body count upon termination from the Callaway Site in 1987.

Discussion: Dosimetry records show that the alleged terminated employment at the Callaway Plant in February 1988 without going through the proper clearance process, which includes health physics (HP) department notification and, therefore, the required whole body count (WBC). The alleged was notified by the Callaway Dosimetry Foreman in a letter dated March 30, 1988, that he had neglected to properly notify the HP department during the termination process. The licensee offered to perform a WBC on him if he would return to the plant, or they would accept information from a WBC given to him by other nuclear facilities since his employment at Callaway in order to close out his dosimetry records. The licensee did not receive a response to the letter.

Finding: The inspectors were able to confirm that the alleged had not received a WBC upon termination because he did not notify the health physics department of his termination. The licensee informed the alleged that he had not followed proper termination procedure and, therefore, had not received a required WBC. The licensee offered to give him a WBC if he returned to the Callaway Site. The alleged did not respond to the letter or return to the site for a WBC. The concern was partially substantiated. This concern is closed.

Concern No. 2: Radiation monitors (whole body friskers) alarms were reset to higher levels to prevent them from alarming so often.

Discussion: The inspectors interviewed members of the health physics staff and technicians who could have reset the whole body frisker (WBF) alarm setpoints or know if they had been reset for any reason. The consensus was that WBF alarm setpoints have never been raised or reset to avoid alarms; however, during periods of atmospheric inversion which may cause the WBF to alarm at their normal setting, the WBFs are not used for contamination control. Hand held friskers using an alpha/beta factor and gamma spectroscopy, are used to determine personnel contamination. This is health physics policy and is governed by procedure.

Finding: The concern was not substantiated. There was no evidence to support the concern and it is, therefore, considered closed.

Concern No. 3: Security personnel were not allowed to wear paper suits when entering radiation areas to insure that the licensee would not run out of suits.

Discussion: The inspectors interviewed HP and security personnel and also reviewed the RWP for security tours in the plant. The Radiation Work Permit (RWP) permits paper suits as an option when touring the RCA. The inspectors noted several paper suits hanging on a coat rack at the RCA entrance. None of the personnel interviewed remembered not permitting security personnel to wear the suits; however, during periods of high use, there may have been an occasional shortage.

Findings: The concern was not substantiated. While there may have been an occasional shortage of paper suits during periods of high use, the intent of the paper suit which is worn over the guard's normal polyester uniform is to prevent/limit the contamination from naturally occurring radioisotopes. The licensee's use of paper suits in this manner is for the convenience of the guards and is not RWP required protective clothing. This concern is considered closed.

Allegation (AMS No. P111-90-A-0099)(Closed):

Concern No. 1: Personnel are kept in containment in a ready status for several hours without having any work to do.

Discussion: The inspectors interviewed contractor management and contract electricians, pipefitters, laborers, and boilermakers on both shifts to determine if workers ever waited in containment for hours without having any work to do. All of the contract workers stated that they may have waited in containment for half an hour or so in a posted LOW DOSE area, but not any longer. They said they usually waited in a holding area which was set up inside the containment/fuel building step off pad (SOP), but outside containment. Workers can wait in this area and be fully dressed in RWP clothing in a NO DOSE area. The ALARA Coordinator and the containment radiation protection technicians were

also interviewed and they stated the holding area just outside the containment hatch was the normal wait area. The allegor's dose for the period he worked at Callaway (September through October 26, 1990) was 295 millirem. The LOW DOSE areas in containment are clearly marked and visible.

Finding: The concern was not substantiated. There was no evidence that workers waited for hours inside containment without having work to do. Usually, workers would wait just outside the containment hatch where they can be fully dressed out and in a NO DOSE area; however, if they are waiting inside containment they would normally wait in a LOW DOSE area. This concern is considered closed.

Concern No. 2: A worker was sent home with contamination on his knees and with his knees wrapped in plastic.

Discussion: The inspectors contacted RP management to determine the licensee's methods for handling personnel contamination incidents. Personnel contaminations are separated into clothing contamination and skin contamination incidents. Skin contaminations are handled as either particle or area contaminations. If the contamination is determined to be a radioactive particle, it is located, removed and saved. If an area of the skin is contaminated, standard decontamination methods are used to reduce or remove the contamination. One method used to remove low levels of contamination that remain after the normal methods, such as washing with soap and water, is to wrap the contaminated area in plastic or rubber in order to sweat the contamination out of the skin. The licensee remembered such an incident during the outage, when a worker's knees remained slightly contaminated (600 DPM) after standard decontamination procedures were implemented. The worker's knees were wrapped in plastic and he was allowed to go home for the night. This is not an unusual practice.

Finding: The concern was substantiated; however, this is not an unusual practice. This concern is considered closed.

Concern No. 3: Contractor management told their employees not to go to the NRC with concerns.

Discussion: The inspectors asked the allegor if he could recall who in management made this statement. The allegor said he could not remember. The inspectors asked if there were any other witnesses to this statement. The allegor said the statement was made during his initial training period, which he attended with many of his fellow workers. The inspector interviewed Fluor management, electricians, pipefitters, laborers, and boilermakers, on both shifts to determine if management told workers not to go to the NRC with concerns. None of the workers interviewed said that they were told not to go to the NRC about concerns. The workers said they were told that if the NRC talks to them they should answer openly and honestly. The inspectors interviewed Fluor management personnel including the Project Manager, Lead Superintendent, and several lead foremen. None of the management personnel interviewed said they told workers not to talk to the NRC about concerns.

Finding: The inspectors found no evidence to support this concern. This concern is considered closed.

No violations or deviations were identified in this area.

7. Exit Meeting (71707)

The inspectors met with licensee representatives (denoted under Persons Contacted) at intervals during the inspection period. The inspectors summarized the scope and findings of the inspection. The licensee representatives acknowledged the findings as reported herein. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.