

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/87036(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: December 5, 1987 through February 6, 1988

Inspectors: B. H. Little  
C. H. Brown

Approved By: *R. M. Loran for*  
J. M. Hinds, Chief  
Reactor Projects Section 1A

2/23/88  
Date

Inspection Summary

Inspection from December 5, 1987 through February 6, 1988  
(Report No. 50-483/87036(DRP))

Areas Inspected: A routine unannounced safety inspection of Licensee Event Reports (LERs), inspector-identified problems, plant operations, engineered safety features (ESF) system walkdown, radiological controls, maintenance, surveillance, fire protection, emergency preparedness, security, quality programs and administrative controls affecting quality, training and qualification effectiveness and regional requests.

Results: Of the 13 areas inspected, no violations were identified in 12 areas. One violation was identified in the remaining area (failure to place the auxiliary feedwater pressure switch in a tripped condition within one hour - paragraph 2.d). However, in accordance with 10 CFR 2, Appendix C, Section V.A, a Notice of Violation was not issued. The violation was of minor safety significance.

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## DETAILS

### 1. Persons Contacted

- D. F. Schnell, Vice President, Nuclear
- \*G. L. Randolph, General Manager, Nuclear Operations
- \*J. D. Blosser, Manager, Callaway Plant
- C. D. Naslund, Manager, Operations Support
- A. P. Neuhalphen, Manager, Quality Assurance
- \*J. R. Peevy, Assistant Manager, Technical Services
- W. R. Campbell, Assistant Manager, Nuclear Engineering
- M. E. Taylor, Superintendent, Operations
- D. E. Young, Superintendent, Maintenance
- W. R. Robinson, Assistant Manager, Operations and Maintenance
- R. R. Roselius, Superintendent, Health Physics
- T. P. Sharkey, Supervisor, Compliance
- G. J. Czeschin, Superintendent, Planning and Scheduling
- W. H. Sheppard, Superintendent, Outages
- G. R. Pendegriff, Superintendent, Security
- \*L. H. Kanuckel, Supervisor, Quality Assurance Supervising Engineer
- R. D. Affolter, Superintendent, Systems Engineering
- J. V. Laux, Superintendent, Technical Support, Quality Assurance
- G. A. Hughes, Supervisor, Independent Safety Engineer Group
- J. C. Gearhart, Superintendent, Operations Support, Quality Assurance
- \*J. J. Cassmeyer, Quality Assurance Engineer

\*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. Inspection of Licensee Event Reports (92700)

Through direct observations, discussions with licensee personnel, and a review of records, the following licensee event reports were reviewed to determine that reportability requirements were fulfilled, that immediate corrective action was accomplished, and that corrective action to prevent recurrence was accomplished in accordance with Technical Specifications (T/Ss). The LERs listed below are considered closed.

- a. LER 87-003-00: Reactor protection system actuation due to inappropriate human performance and valve failure.

On April 2, 1987, a reactor protection system actuation occurred due to the water level in the "D" steam generator reaching the lo-lo level trip setpoint. The plant was in the process of shutting down for other reasons and was subcritical at the time of the trip. In accordance with a plant procedure, the operator shut all the auxiliary feedwater (AFW) flow control valves before starting the motor-driven auxiliary feedwater (MDAFW) pumps. The operator noted the closure demand for the valves, but failed to verify a closed indication for the "A" steam generator AFW flow control valve. When he started the

MDAFW pumps, he found that he could not throttle the "A" steam generator AFW flow control valve. He shut off the "B" MDAFW pump (securing AFW flow to the "A" and "D" steam generators) to provide time for manually shutting the valve, but AFW flow was not reestablished in time to prevent the "D" steam generator from reaching its lo-lo trip setpoint. All systems responded as designed, and the plant was placed in a stable shutdown condition. The breaker for the AFW valve for the "A" steam generator was found in the open position. The breaker was replaced and tested; no problems were discovered. The valve was tested satisfactorily. The length of time that the breaker had been open could not be determined.

LER 87-003-00 is considered closed.

- b. LER 87-029-00: Containment purge and control room ventilation isolations.

On October 8, 1987, an ESF automatic actuation signal was received from the containment purge radiation monitor, which resulted in a containment purge isolation (CPI) and a control room ventilation isolation (CRVI). The vessel had been defueled, and no abnormal airborne radioactivity levels were detected. The actuation was considered spurious, and all systems were returned to normal.

LER 87-029-00 is considered closed.

- c. LER 87-014-00: ESF actuation due to a failed power supply.

On July 18, 1987, a CRVI, a fuel building isolation (FBI), and a CPI occurred. These actuations resulted from a power supply failure in an engineered safety features actuation signal (ESFAS) cabinet. The proper actuations of the components were verified. The defective power supply unit was replaced, but the cause of the failure could not be determined.

LER 87-014-00 is considered closed.

- d. LER 87-022-01: Two occurrences of T/S 3.0.3 unknowingly entered when action statement for inoperable AFW pressure channel not met due to procedural inadequacies.

On August 28, 1987, an AFW suction pressure (AFSP) channel was placed out of service to perform a T/S-required surveillance. Per T/S 3.3.2.c.6-h, this channel should have been placed in the tripped condition within one hour of being declared inoperable. Operators discovered that the channel had not been placed in the tripped condition about three and one-half hours late, during which time the plant had unknowingly entered T/S 3.0.3. This channel is not readily testable in the tripped condition, and the one-hour time limit is usually sufficient to perform the surveillance. The surveillance was not immediately completed on this date due to troubleshooting. The procedure was revised to call out the one-hour T/S time limit. Other procedures were reviewed for similar

inadequacies. A review of previous surveillances revealed one similar situation in which the plant had unknowingly entered T/S 3.0.3. The licensee's failure to place the AFSP channel in the tripped condition within one hour is a violation of T/S 3.3.2. The violation meets the tests of 10 CFR 2, Appendix C, Section V.A; consequently, no Notice of Violation will be issued, and this matter is considered closed. The corrective action was timely and appropriate, and the safety significance was minor. The switchover to the alternate water system is a long-term item and would allow time for operator action.

LER 87-022-01 is considered closed.

- e. LER 86-002-01: Environmental qualification (EQ) of the reactor vessel head vent valves had not been implemented. Installation of qualified CONAX seals on the conduit connectors for these valves had been deferred to the first refueling outage. Also, the connectors for the solenoid and limit switch for containment isolation valve BG-HV-8160 lacked qualified seals.

The licensee has installed qualified conduit seals on the components in question. In the case of the solenoid and limit switch for BG-HV-8160, this corrective action was conservative, in that a licensee analysis shows that an environmentally initiated failure would result in the closure of the containment isolation valve. A complete discussion of the safety significance of this issue and of the corrective actions taken to ensure proper sealing of electrical connections is contained in Inspection Report No. 483/87015(DRS), which closed two related unresolved items.

LER 86-002-01 is considered closed.

3. Follow-up on Inspector-Identified Problems (92701)

Open Item 87018-01: Fire brigade drill deficiencies were identified by the NRC during the licensee's emergency exercise on June 3, 1987. The deficiencies included timeliness of gathering and donning fire fighting equipment, team directions and coordination, and a performance error.

The inspector witnessed both announced and unannounced fire drills to evaluate the performance of fire brigade members in response to simulated plant fires. The fire brigades were adequately staffed, and team members appeared well trained in the use of equipment and fire-fighting techniques. The team members responded in a timely manner and displayed professionalism during the drills. The brigade leaders provided effective direction and coordination of the fire-fighting activities.

Open item 87018-01 is considered closed.

Unresolved Item 87020-01: Adverse trend in performance errors associated with T/S surveillance activities. This matter addressed the increased frequency of missed T/S surveillances associated with infrequent activities and with requirements which are conditional in nature.

The licensee's response in this matter included the assignment of a Conditional Surveillance Task Force and a Fuel Handling Task Force as subcommittees of the On-Site Review Committee (ORC). The teams were responsible for event evaluation, identification of generic weaknesses and root causes, and recommendations for corrective action. This effort revealed that conditional surveillances lacked an adequate triggering mechanism, and found human factor weaknesses in fuel handling procedures. The licensee has completed corrective actions to prevent recurrence. The long-term improvement recommendations of the task forces have been entered in the Plant Manager's action tracking system.

The inspector determined that this matter received appropriate licensee attention and response. There has been no recurrence of similar events in the past four months. Unresolved item 87020-01 is considered closed.

No violations or deviations were identified.

4. Plant Operations (71707)

a. Operational Safety Verification

Inspections were routinely performed to ensure that the licensee conducts 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 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 inspections included direct observation of activities, tours of the facility, interviews and discussions with licensee personnel, independent verification of safety system status and LCOs, and reviews of facility procedures, records, and reports.

b. Off-shift Inspections of Control Rooms

The inspectors performed routine inspections of the control room during off-shift and weekend periods; these included 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 also reviewed the licensee's administrative controls regarding "Conduct of Operations" and interviewed the licensee's security personnel, shift supervisors and operators to determine if shift personnel were notified of the inspectors' arrivals on site during off-shifts.

The inspectors determined that both licensed and non-licensed operators were attentive to their duties, and that the inspectors' arrivals on site were unannounced. The licensee has implemented appropriate administrative controls related to the conduct of operations. These include procedures which specify fitness for duty and operator attentiveness. Personal radios and reading materials are prohibited.

No violations or deviations were identified.

5. ESF System Walkdown (71710)

The operability of selected engineered safety features was confirmed by the inspectors during walkdowns of the accessible portions of several systems. The following items were included: verification that procedures match the plant drawings, equipment conditions, housekeeping, instrumentation, valve and electrical breaker lineup status (per procedure checklist), and verification that locks, tags, jumpers, etc. are properly attached and identifiable. The following systems were walked down during this inspection period:

- "A" Emergency Diesel Generator
- Component Cooling Water System
- Essential Service Water System
- Auxiliary Feed Water System
- Reactor Trip System
- 125-Volt D.C. Power Source
- AC Electrical Vital Power Source

No violations or deviations were identified.

6. Radiological Controls (71709)

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, contamination, and radioactive waste controls. The inspection also included a routine review of the licensee's radiological and water chemistry control records and reports. Good HP housekeeping practices were observed. The inspectors observed that personnel entering, working in, and exiting radiological control areas generally displayed good radiological work practices.

No violations or deviations were identified.

7. Maintenance (62703)

Selected portions of the plant 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 inspections included activities associated with preventative and corrective maintenance of electrical, instrumentation and control, and mechanical equipment and systems. 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 calibration was 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.

The reviewed maintenance activities included:

<u>Work Request No.</u>	<u>Activity</u>
WR R110077A	Maintenance of emergency diesel generator (EDG) starting air compressor.
WR R109535A	Essential service water to aftercooler valve work.
Multiple work requests	Preventative maintenance on emergency diesel generator.

No violations or deviations were identified.

8. Surveillance (61726)

The inspectors reviewed or observed selected portions of the Technical Specifications required surveillance testing during power operations. Items which were considered during the inspection included whether adequate procedures were used to perform the testing, whether test instrumentation was calibrated, whether test results conformed with Technical Specifications and procedural requirements, and whether tests were performed within the required time limits. The inspectors determined that the test results were reviewed by individuals other than the personnel involved with the performance of the tests, and that any deficiencies identified during the testing were reviewed and resolved by appropriate management personnel.

The inspectors' overview of the licensee's surveillance program showed that the licensee had developed and implemented a comprehensive and effective program.

The reviewed surveillances included:

<u>Procedure No.</u>	<u>Activity</u>
OSP-ZZ-00001	Control Room Shift and Daily Log Reading and Channel Checks.
MTE-ZZ-QA001	Motor Operated Valve Testing (MOVATS).
ETP-ZZ-ST012	Engineering Evaluation Test for Temperature Increase of Room With Diesel Running With Ventilation Fan Off and Outside Temperature Less Than 65 Degrees Fahrenheit.
OSP-GT-LL161	Containment Ventilation Isolation Valves Local Leak Rate Test.
OSP-NE-C0001	Diesel Generator Rocker Arm Prelube.
OSP-NE-00002	Diesel Generator Periodic Tests.
OSP-KJ-V0001	Section IX Diesel Generator Aftercooler Mode 1 Valve Operability Test.
OTN-NE-00001	Normal Operating Procedure Diesel Generator.
ISL-GN-OP935	Loop Pressure: Containment Pressure Protection.
ISF-SE-0N42B	Functional Nuclear: Nuclear Instrumentation Power Range N42.

No violations or deviations were identified.

9. Fire Protection (64704)

Implementation of the licensee's fire protection/prevention program was routinely assessed by the inspectors during plant tours. The inspection included observation of housekeeping conditions, storage and control of combustible material, operability of fire protection/suppression systems, and fire brigade staffing and training.

Two unannounced and two announced fire brigade drills were monitored during the inspection interval. The response time of the brigade to assemble was satisfactory. The manual fire equipment was noted to have been maintained; and at the completion of the drills, the equipment was returned to readiness status.

The housekeeping and control of combustible materials and flammable liquids were found to be satisfactory. A review of selected surveillances for this area indicated that the surveillances were up to date. The operability of the fire protection/suppression equipment and systems was

maintained. Fire watches and patrols were utilized in areas of the plant when required by the Technical Specifications.

No violations or deviations were identified.

10. Emergency Preparedness (82301)

An inspection of emergency preparedness activities was performed to assess the licensee's implementation of the emergency plan and implementing procedures. The inspection included the monthly observation of emergency facilities and equipment, interviews with licensee staff, and a review of selected emergency implementing procedures.

No emergency preparedness drills were performed during this inspection interval.

No violations or deviations were identified.

11. Security (71881)

The licensee's security activities were observed by the inspectors during routine facility tours and during the inspectors' site arrivals and departures. Observations included the security personnel's performance associated with access control, security checks, and surveillance activities, and focused on the adequacy of security staffing, the security response (compensatory measures), and the security staff's attentiveness and thoroughness.

All trailers inside the fence have had the skirting renewed. The skirting is stenciled with a note to contact security if there is a need to remove skirting.

No violations or deviations were identified.

12. Quality Programs and Administrative Controls Affecting Quality (35701)

An inspection of the licensee's quality programs was performed to assess the implementation and effectiveness of programs associated with management control, verification, and oversight activities. The inspectors considered areas indicative of overall management involvement in quality matters, including the frequency of management plant tours and control room observations, and management personnel's attendance at technical, planning/schedule, and committee meetings. The inspectors attended On-Site Review Committee meetings and incident/event critiques and reviewed related documents, focusing on the licensee's root cause determinations and corrective actions. The inspectors accompanied licensee management on monthly plant tours, which focused on quality activities and material conditions within the plant. The inspection also included a review of quality records and selected quality assurance audit and surveillance activities. Performance in this area included the following major items:

a. Safety System Functional Assessment

On February 2, 1988, the licensee notified the senior resident inspector of a potential deficiency associated with the height of the partial walls located in the essential service water (ESW) pump rooms. The partial walls separate the ESW pumps from associated electrical switchgear. The as-built drawings specify a wall height of six feet. The walls were actually constructed eight feet, nine inches high. The deficiency was identified by the licensee during the performance of a Safety System Functional Assessment (SSFA) of the ESW system.

At 3:10 p.m., following an engineering review and discussions with the architect engineer (Bechtel), the licensee determined that the correct wall height should be that specified in the as-built drawings, and that the existing wall height placed the plant in Technical Specification (T/S) 3.0.3 action requirements. The licensee made an oral request to NRC Region III for enforcement discretion. At 4:05 p.m., Region III granted enforcement discretion to allow continued plant operation.

At 5:25 p.m., the ESW Train B wall was restored to a height of six feet, Train B was declared operable, and T/S 3.0.3 was exited. On February 3, 1988, the Train A partial wall was restored to a height of six feet, and the Limiting Condition for Operation related to ESW operability (T/S 3.7.4) was satisfied.

The licensee's evaluation in this matter is continuing. This matter is unresolved, pending further NRC review. (Unresolved Item 483/87036-01 (DRP))

b. 10 CFR 50.59 Review (37700)

A sample inspection of licensee design changes and modifications was performed by the NRC Project Manager (PM)-Callaway to ascertain that changes are in conformance with license requirements. The inspection included a review of change descriptions, design documents, and safety evaluations, and discussions with the licensee's engineering staff. The following licensee 10 CFR 50.59 evaluations were reviewed.

<u>Activity No.</u>	<u>Type of Change</u>	<u>Description</u>
NE-860117	Final Safety Analysis Report (FSAR) Change	Revised the procedure for reactor vessel head removal and installation.
CMP-860042	Design Change	Blanked off the exhaust from rooms 1501 and 1512 (control room air conditioning equipment rooms) to prevent a possible unmonitored release.

RFR-02852	Request for Resolution	Evaluated diesel generator (DG) and ESW operability with their respective supply fans out of service. ESW supply fans must be operable at all times. DG supply fans must be operable if ambient temperature is greater than 65 degrees Fahrenheit.
NE-360188	Engineering Technical Procedures	A procedure was written, for Mode 3 operation, to determine how the reactor flow anomaly behaves with various combinations of reactor coolant pumps running.
CMP-84-0396	Design Change	This change resulted in the installation of the containment breathing air system. This system provides breathing air for personnel working inside containment.

No violations or deviations were identified.

13. Training and Qualification Effectiveness (41400)

A performance evaluation of the licensee staff and contractors was performed to assess the effectiveness of the licensee's training and qualification program. The following items were considered:

- Program implementation (various work groups).
- Understanding of work.
- Event and problem causal factors.
- Experience feedback.

The inspection included personnel interviews, direct observation of training, operation, maintenance, and testing activities, observation of incident/event response, and a review of quality records and reports.

No violations or deviations were identified.

14. Regional Requests (92701)

- a. Quality of spent fuel racks fabricated by U.S. Tool and Die and its predecessor.

An NRC inspection of the U.S. Tool and Die facility performed in March 1987, identified U.S. Tool and Die quality assurance (QA) program deficiencies concerning in-process examination and weld inspection in the fabrication of spent fuel racks. Because the spent fuel racks for the Callaway Plant were purchased from U.S. Tool and Die and/or its predecessor, Watcher Associates, Inc., the licensee was requested to provide to the NRC the following information:

1. The extent to which the U.S. Tool and Die quality assurance/quality control program was relied upon to assure rack quality.
2. The licensee's in-factory and/or receipt inspection of the racks.
3. What findings were made during the licensee's receipt inspection of the racks.
4. If the licensee's receipt inspections found deficiencies in the racks, what corrective actions were taken.
5. Any additional planned actions or examinations to assure that the racks meet the original design and regulatory requirements.

An inspection was performed to assess the licensee's response in this matter, including the licensee's identification and resolution of deficiencies associated with the spent fuel racks.

The licensee provided the requested information to the NRC in letter number ULNRC-1666 dated October 30, 1987.

Through a sample review of quality assurance records and inspection procedures and interviews with quality assurance personnel, the inspector determined that the licensee provided appropriate quality assurance/quality control overview and inspections and that the deficiencies identified were adequately dispositioned.

The licensee's response in this matter is acceptable. This item is considered closed.

- b. Brown Boveri electric circuit breakers.

In a memo to the senior resident inspector, dated October 27, 1987, it was requested that the follow-up on Information Notice 87-41 by the licensee be assessed. The notice pertained to failures of Brown Boveri electric circuit breakers and to the manufacturer's repair letter addressing the problem. The memo requested that the licensee's actions be reviewed and to determine whether the generic implications

were considered. The licensee determined that the notice was not applicable to Callaway. The generic problem was not pursued, as the licensee had not been notified of any similar problems with the type of breakers installed in the plant and had not experienced any similar problems with the breakers on site.

This item is considered closed.

15. Unresolved Item

Unresolved items are matters about which more information is required in order to ascertain whether it is an acceptable item, a violation, a failure to meet a licensee commitment, or a deviation. An unresolved item disclosed during the inspection is discussed in Paragraph 12.a. of the report.

16. Violations for Which a "Notice of Violation" Will Not be Issued

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensee initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the tests of 10 CFR 2, Appendix C, Section V.A. These tests are: (1) the violation was identified by the licensee; (2) the violation would be categorized as Severity Level IV or V; (3) the violation was reported to the NRC, if required; (4) the violation will be corrected, including measures to prevent recurrence, within a reasonable time period; and (5) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation. A violation of regulatory requirements identified during the inspection for which a Notice of Violation will not be issued is discussed in Paragraph 2.d.

17. Exit Meeting (30703)

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.