U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/82-11(DETP)

Docket No. 50-483 License No. CPPR-139

Licensee: Union Electric Company
Post Office Box 149
St. Louis, MO 63166

Facility Name: Callaway Plant, Unit 1

Inspection At: Callaway Site, Callaway County, MO

Inspection Conducted: September 13-17, 1982

Inspectors: M. A. Ring 10/25/82

P. R. Wohld 10/25/82

Approved By: I. N. Jackiw, Chief 10/25/82
Test Program Section

Inspection Summary

Inspection on September 13-17, 1982 (Report No. 50-483/82-11(DETP))
Areas Inspected: Routine announced inspection to review the preoperational test program for document control, design changes and modifications, test and measurement equipment, to review preoperational test procedures, and to followup on previous open items. The inspection involved 60 inspector-hours onsite and 66 inspector-hours offsite by two NRC inspectors including 0 inspector-hours onsite during offshifts.
Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

*J. F. McLaughlin, Assistant to Vice President - Nuclear
*J. N. Kaelin, Superintendent of Startup
*M. E. Taylor, Superintendent, Operations
*J. V. Laux, Supervisor Engineer, QA Startup
*R. Phillips, Test Program Coordinator
*D. Brady, Startup Program Coordinator
*M. J. Pechar, QA Consultant
*R. K. Cothron, Engineering Coordinator

*Denotes those attending the exit interview.

Additional plant technical and administrative personnel were contacted by the inspectors during the course of the inspection.

2. Licensee Action on Previous Items

(Closed) Open Item (483/81-26-03): The item dealt with instructions governing turnover of systems from Startup to Operations not yet being developed. Instructions are now developed and the inspector reviewed NCAI-18 (Startup) and APA-22 (Operations) governing turnover. The instructions were found to be acceptable for the current stage of plant life and the item is considered closed.

3. Document Control

The inspectors reviewed the licensee's program to verify that administrative measures have been established which provide for:

a. Test procedure review, approval, and issuance.

b. Revision and change to approved procedures.

c. Use of operating procedures during preoperational testing.

d. Use of current approved drawings.

e. Administration of drawing and manual master index.

f. Update of affected test procedures upon revision of drawings or manuals.

During the review, the inspectors noted that minor change numbering did not provide for more than one test with the same system designator. The licensee agreed to change the instruction to make minor changes identified to each individual test rather than by system designator. This response was considered acceptable by the inspectors. The

licensee's Nuclear Construction Administrative Instructions (NCAI) were the primary documents utilized in the review.

No items of noncompliance were identified.

4. Design Changes and Modifications

The inspectors reviewed the licensee's program to verify that written administrative controls had been established governing design changes. The program was reviewed to ensure the following:

a. A formal method was established for initiating, reviewing and approving requests for design changes.

b. The design change review process assures that changes are reviewed for potential FSAR and Unreviewed Safety Question impact.

c. Controls have been established to assure design changes will be subjected to measures commensurate to those applied to the original design.

NCAI-12, 14, 16 and 22 were the primary documents utilized in the review and, in addition, the inspectors reviewed the AE (Bechtel, Sverdrop and Parcel) forms utilized for processing design change requests.

The inspectors also reviewed the licensee's program to verify that written administrative controls had been established governing temporary modifications. The program was reviewed to verify that the controls required a formal log be maintained of the status of jumpers, lifted leads, etc.; that jumpers or lifted leads will be readily identifiable by their physical appearance and that controls are established to account for such things as strainers, spool pieces and blank flanges where temporary modifications to fluid systems are required. Regulatory Guide 1.68, ANSI N18.7 and N45.2.4 were utilized in the review along with NCAI-11.

The inspectors noted that the licensee's temporary alterations procedure (NCAI-11) exempted temporary alterations made via test procedures from the requirements of NCAI-11. The inspector stated that this was not acceptable unless the test procedures invoked the applicable controls of NCAI-11 such as independent verification and alterations readily identifiable by appearance. This area is considered an unresolved item (483/82-11-01) pending inspector review of test procedures for temporary alteration controls. In addition, NCAI-11 does not appear to address the interface between Operations and Startup. Each organization is currently intending to have its own instruction for temporary alterations and implement them independently. The inspector views this as a difficult method of operation (particularly in the latter stages of testing where many systems belong to each organization) unless controls and guidance governing the overlap and interface of responsibilities are developed. The inspectors pointed

out that typically a test engineer will have responsibility for a system whereas the shift engineer will have responsibility for the plant or many systems. The licensee agreed to review this area with the intent of developing instructions for coordinating Startup and Operations. The inspector also pointed out that this review should include but not be limited to temporary alterations. This area is an open item (483/82-11-02) pending further review by the licensee and the inspector.

No items of noncompliance were identified.

5. Test and Measurement Equipment

The inspectors reviewed and discussed with the licensee his program and administrative procedures for control of test and measurement equipment during the preop and startup programs to determine if the program addressed the following:

a. A listing of controlled test equipment, the calibration requirements, and the calibration history.

b. Controls for storage and issuance to preclude use of equipment which has not been calibrated within the specified interval.

c. Requirements for recording test equipment identity and calibration date in test procedures to permit retest if equipment is subsequently found out of calibration.

ANSI N18.7, ANSI N45.2 and ANSI N45.2.4 were utilized in the review along with Nuclear Construction Administrative Instructions 9, 5, 16 and 22. The inspectors found that the above instructions appeared to adequately address test and measurement equipment, except for permanent plant instruments where they might be used in the test program and up to the point where the Union Electric Nuclear Operations program would be implemented. In particular, no provisions were made for ensuring calibration and periodic recalibration for permanent plant instruments. The particular preoperational tests which had been started to date were reviewed and, in fact, contained more than adequate requirements in this area. However, the programmatic instructions did not cover this area. This is an open item (483/82-11-03) pending licensee development of administrative controls and subsequent inspector review.

The inspectors also noted that in the Callaway FSAR, Union Electric does not commit to using a calibration sticker program for plant instruments as would normally be required by Regulatory Guide 1.30, ANSI N45.2.4 and IEEE 336. The inspectors discussed this position and the substitute methods for indicating and verifying calibration which Union Electric intends to use with the Operations and Startup organizations. The inspectors are concerned that without a sticker program some of the advantages of stickers are unavailable, such as immediate visibility at location and ability to quickly determine a

due date or an out of calibration situation. This area is an open item (483/82-11-04) pending inspector review of the administrative controls for verifying instrument calibration status.

No items of noncompliance were identified.

6. Preoperational Test Procedure Review

a. Instrument AC (CS-03NN01)

The inspector reviewed test procedure CS-03NN01, Revision 0, dated March 16, 1982 on the Instrument AC System against the FSAR, SER, Regulatory Guides 1.68 and 1.30, ANSI N45.2.4 and IEEE 336. During the course of the review, the system test engineer pointed out that the load test currently contained in the procedure may be deleted because the Architect Engineer (Bechtel) does not believe it is required. The inspector stated that the load test should not be deleted and pointed out that Regulatory Guide 1.68, Appendix A, Revision 2, dated August 1978 states, in both Sections 1.g.(1) Normal AC Power Distribution System and 1.g.(2) Emergency AC Power Distribution System, the following, "This testing should simulate, as closely as practical, actual service conditions, e.g., fully loading motor control centers and operation of supplied loads at rated conditions, etc."

The inspectors also noted that the Instrument AC test did not contain a demonstration of the ability of the inverters or the backup transformers to supply regulated power to the instrument bus if the supply to inverters or transformers varied through its allowable range. A test to determine proper response over the operating range of the device is required by IEEE 336, Paragraph 6.2.1. The licensee stated, that although such a test was not currently included in CS-03NN01, this procedure was being revised and this test may be included in the NF test procedure which has not yet been reviewed. This subject is considered an open item (483/82-11-05) pending additional inspector review.

b. 125V Class 1E DC System (CS-03NK01)
(Draft test procedure review)

The inspector reviewed a preliminary copy of preoperational test procedure CS-03NK01, 125V Class 1E DC System (signed by the test engineer on October 22, 1981), against Regulatory Guides 1.68 and 1.30, ANSI 45.2.4 (also IEEE 336-1971), FSAR Chapters 8 and 14 commitments, and the 640 series FSAR Question Responses. As a result of this review and subsequent discussion with the test engineer, the inspector is concerned that the scope of testing is inadequate to meet the requirements of IEEE 336-1971, Paragraphs 6.2.1 and 6.2.2, and Regulatory Guide 1.68, Appendix A, item 1.g.(4) (subsequently referenced herein as Regulatory Guide 1.68). The following concerns are considered open items:

Regulatory Guide 1.68 states, "Demonstrate design capability of battery chargers...." The inspector believes that appropriate testing under this requirement should include verification of the charger requirements such as output voltage regulation during variation of the input AC, the output current limiting feature, output voltage filtration, and possibly others. This is an open item (483/82-11-06).

Regulatory Guide 1.68 states, "Demonstrate redundancy and electrical load independence." Regulatory Guide 1.41 also states that "As a minimum, a suitable test should assure that each redundant on-site power source and its load group can function without any dependence upon any other load group or portion thereof." The test for two degrees of separation for plant load groups one and two is identified in Chapter 14, Load Sequencer Preoperational Test (S-03NF02), and utilizes "two-battery" combinations. This is not adequate to verify redundancy and separation requirements that exist between individual battery loads. This concern for separation testing also extends beyond the directly connected DC loads, such as to the vital AC loads connected to each vital inverter. This is an open item (483/82-11-07).

Regulatory Guide 1.68 states, "Demonstrate...that actual total system amperage loads are in agreement with design loads." Load verification is not included as part of the reviewed test. The test engineer indicated that the battery loads will be verified during the more comprehensive, integrated testing of plant systems. It is the inspector's position that individual load measurements should be verified, when possible, under the more controlled conditions of subsystem testing. Any load verification during integrated system testing is good practice but obtaining new information at this time should be limited to transient loads that are otherwise difficult to determine. This is an open item (483/82-11-08).

Regulatory Guide 1.68, Appendix A, Item 1, states that "Preoperational tests should demonstrate that structures, systems, and components will operate...throughout the full design operation range." The inspectors' note that this should include testing of DC loads at the highest DC voltage expected to be present under normal conditions. However, this testing is not included in the reviewed test procedure nor does it appear to be included elsewhere. This testing is needed to assure that the DC loads will withstand the high voltage and will remain operable while subjected to it. This is an open item (483/82-11-09). (Low voltage testing appears to be included according to the test described in Chapter 14, LOCA Sequencer Preoperational Test (S-03NF02), Objective 14.2.12.64.1g. It will be reviewed as part of that package when available.)

A concern was expressed by the test engineer that the 125V vital inverters do not meet all of their specifications. This will be

considered an Open Item (483/82-11-10) pending further information from the licensee on the adequacy or acceptability of the vital inverters.

Battery cell connector bolting problems at another site were discussed. The licensee committed to testing the connector bolting after the battery discharge test to determine if the discharge has an adverse affect on bolting torque values. Implementation of this will be reviewed at a later time.

c. Spent Fuel Pool Cooling and Cleanup System (CS-03 EC01, Revision 0, July 18, 1982)

The inspector discussed several aspects of fluid system testing with the licensee including the prevention of damage to heat exchangers from excessively high flow rates and the detection of system cavitation for which corrective action may prevent early pipe or equipment failure. The licensee noted the inspectors comments in this area.

Review of the test document and discussion with the licensee resulted in one open item involving vibration testing. Vibration testing was not described in the test procedure nor was it specified adequately in the NCAI manual. This is an open item (483/82-11-11) pending further information from the licensee on what the intended vibration test program will be to meet the requirements of Regulatory Guide 1.68, Revision 2, and Sections 3.9.2 of the FSAR and SER.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 4.

8. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on September 17, 1982. The inspectors summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors with respect to the open items and the unresolved item.