U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/86007(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, MO

Inspection Conducted: February 19 through March 12, 1986

Inspector: B. H. Little

Approved by: W. L. Forney, Chief
Reactor Projects Section 1A

3/31/86
Date

Inspection Summary

Inspection on February ~~20~~ 19 through March 12, 1986 (Report No. 50-483/86007(DRP))
Areas Inspected: Special unannounced safety inspection by the senior resident inspector of the Environmental Qualification of electrical equipment. The inspection involved a total of 63 inspector-hours by one NRC inspector including 14 inspector-hours onsite during off-shifts.
Results: One apparent violation with two examples was identified (Failure to environmentally qualify electrical equipment - Paragraphs 2.a.(1) and (2). One unresolved item (reportability requirements - Paragraph 2.b.(3).

DETAILS

1. Persons Contacted

*D. F. Schnell, Vice President, Nuclear
*S. E. Miltenberger, General Manager, Callaway Plant
*G. L. Randolph, Manager, Callaway Plant
*A. P. Neuhalfen, Manager, Quality Assurance
*D. W. Capone, Manager, Nuclear Engineering
A. C. Passwater, Superintendent, Licensing
*W. R. Campbell, Assistant Manager, Nuclear Engineering
*R. D. Affolter, Superintendent, Engineering
*D. C. Poole, Consultant
W. H. Stahl, Supervisor, Engineering
J. V. Laux, Supervisor, Quality Assurance
*J. D. Blosser, Assistant Manager, Operations and Maintenance
*T. P. Sharkey, Supervisor Compliance
*W. R. Robinson, Superintendent Instrumentation and Controls

*Denotes those present at one or more management interviews.

2. Inspection of Environmental Qualification (EQ) Deficiencies (93702)

a. Background

A special safety inspection by the senior resident inspector was performed to assess the EQ deficiencies associated with the Reactor Vessel Head Vent (RVHV) valves and the Chemical Volume and Control System (CVCS) Containment Isolation Valve. The EQ deficiencies were limited to the electrical connections to the solenoid valves associated with the RVHV valves and the CVCS Containment Isolation Valve in that the installed connections were not the connections (Conax) which had been environmentally qualified.

b. Inspection Findings

(1) RVH/Valves

February 19, 1986: During a review of Work Requests (WRs), which were scheduled to be completed during the forthcoming refueling outage, the inspector noted that WR Nos. 22381 through 22384 contained instructions for the installation of Conax connectors on the RVHV Solenoid Valves BB-HV-8001 A and B and BB-HV-8002 A and B. The WRs referenced Callaway Modification Package (CMP) No. 8405-12A. On February 20, 1986, following the inspector inquiry, a licensee engineering supervisor's review of the CMP determined that the installed electrical connections had not been environmentally qualified

and, based on EQ considerations, on February 20, 1986, declared the RVHV valves inoperable, entered Technical Specification 3.4.11 Action requirement and documented the EQ deficiency on Incident Report (IR) No. 86-039.

February 21, 1986: The inspector met with representatives of the licensee engineering, licensing, operations, and quality assurance departments. The licensee discussed the EQ deficiency and the corrective action taken and planned. The licensee had commenced an investigation of this matter to assess the cause and/or contributing factors relating to the identified deficiency and to determine if additional deficiencies existed. The licensee's planned investigation included the following:

(a) All Bechtel and Westinghouse EQ work packages

(b) All open Westinghouse Field Change Notices (FCNs) and Field Deficiency Reports (FDRs)

(c) Master Tracking System (MTS) list dated May 25, 1984, to assess the disposition of EQ related work items and subsequent priority changes or deferrals.

In the review of this matter, the inspector held frequent interviews with licensee engineering, licensing, and operations personnel; and reviewed quality records and reports pertaining to the configuration control of the RVHV system.

During plant construction, a design interface error resulted in the installation of electrical connectors which had not been EQ tested. The RVHV system was designed as a safety grade, Class IE system. The electrical power supply was designed by Bechtel; the mechanical portion (including the solenoid valves) was designed by Westinghouse. EQ testing by Westinghouse was based on the use of Conax connector seals.

May 7, 1984: Westinghouse identified the electrical connection configuration deficiencies and issued FCN No. SPCM-10679 to install Conax connectors. The FCN identified the four head vent valves and 12 additional Target Rock Solenoid operated globe valves.

At the time the FCN was issued, construction and test deficiencies were listed and tracked on the licensee's Master Tracking System (MTS). Prior to the initial fuel load, the licensee implemented a Request for Deferral (RD) process. This process provided for the prioritization of construction and test deficiencies. A RD was processed for the temporary deferral of rework of the 16 valves identified in FCN No. SPCM-10679. The "proposed" Technical Specification (TS) operability requirements were used in the licensee's review process to establish mode restraints.

The RD provided justification, for deferral of the FCN based on the most restrictive components. This was established as a mode restraint of "initial criticality". However, the evaluation determined there was no operational mode restraints associated with the RVHV valves, because the RVHV system was not included in the Technical Specifications.

Callaway Modification Package (CMP) No. 84-05-12A was issued to implement FCN No. SPCM-10679. Conax connectors were installed on the valves identified in the FCN with exception of the RVHV valves. On October 1, 1984, a MTS priority change was processed which deferred the rework of the RVHV valves until the first refueling outage. The inspector was notified of the priority change and was provided the opportunity to review the licensee's review process and to assess any Technical Specification operability impact. The EQ requirements were not identified and apparently not considered during either the initial deferral or the subsequent priority change.

October 18, 1984: The Callaway Plant Operating License No. NPF-30 was issued. The TS issued with this license was revised to include operability requirements of the Reactor Coolant System Vents (TS 3/4.11). In response to the revised TS, the licensee performed an "operability" review. This included the review of TS surveillance requirements and preoperational test data. The review identified a test deficiency in that flow data had not been recorded on one of the parallel vent flow paths. The TS was conditioned to defer this surveillance requirement until the first cold shutdown. The licensee's determination of system operability failed to consider the system's existing EQ deficiencies.

The Callaway Plant Operating License No. NPF-30, License Condition No. 2.C.(3)(a), requires that prior to November 30, 1985 Union Electric shall environmentally qualify all electrical equipment according to the provisions of 10 CFR 50.49.

November 29, 1985: SNUPPS Letter No. SLNRC 85-24 notified the NRC that the electrical equipment required to be qualified under 10 CFR 50.49 had been evaluated and determined to be qualified. The licensee's review efforts failed to identify the existing EQ deficiency associated with the RVHV valves.

The licensee's investigation in this matter found no additional EQ deficiencies and determined this to be an isolated event. The administrative controls governing deferral and priority changes prior to receiving the full power license were TS oriented and are no longer in effect. The engineering review following the TS revision, which added the RVHV system, and reviews prior to the November 29, 1985, (NRC EQ notification) failed to identify the existing EQ deficiency. The licensee

also performed a review of programmatic controls and an assessment of "lessons learned" stemming from this event. This review determined that procedures currently in-place are adequate but would be enhanced by the following action.

(a) The existing administrative procedure will be revised to clearly establish qualification and operability requirements for plant equipment and components. The procedure will also address the program elements which are being utilized to ensure maintenance of equipment qualification and to clearly assign management responsibilities for these elements.

(b) An independent review by Nuclear Engineering will be performed to verify proper identification of preventive maintenance requirements as specified in the EQ packages and conversion to repeating work requests. This review will verify proper identification and periodicity of EQ related preventative maintenance.

(c) System Engineers will be given responsibility for reviewing copies of corrective maintenance work requests after they are generated to provide an independent review to ensure equipment qualification is maintained in accordance with FSAR commitments.

(d) The revision to the administrative procedure will identify programs currently in place to ensure that changes to licensing documents or changes to the physical plant configuration are reviewed for potential impact on the qualification of plant equipment.

The licensee plans to complete the above action by August 1986.

The inspector determined that the EQ deficiency associated with the RVHV valves, once identified by the licensee was promptly documented and received a high level of attention. However, the installation of non-environmentally qualified electrical connections was a condition made known to the licensee by FCN No. SPCM-10679, a condition which was not timely corrected. The Reactor Coolant System vent valves are provided to exhaust noncondensible gasses and/or steam from the reactor vessel that could inhibit natural circulation core cooling, in event of core damage beyond the design basis. The use of non-environmentally qualified connections resulted in a condition in which valve operation could not be assured if the RVHV system was called upon to mitigate a serious safety event. The licensee's failure to environmentally qualify by November 30, 1985, all electrical equipment according to the provisions of 10 CFR 50.49 is a violation of Callaway Plant Operating License No. NPF-30, License Condition 2.C.(3)(a). No. 483/86007-01a.(DRP)

(2) CBCS Containment Isolation Valve

March 6, 1986: The Licensee determined that an EQ deficiency (non-Conax connector) existed on the Chemical Volume and Control System (CVCS) Containment Isolation Valve BG-HV-8160. The EQ deficiency was discovered while replacing an air supply solenoid valve for BG-HV-8160. The work package for the solenoid replacement (CMP 84021 and WR No. 52399B) included instructions to determinate and reterminate Conax connectors. The work was stopped because Conax connectors had not been installed. The licensee issued WR No. 55097 to install the Conax connector, documented the EQ deficiency on Incident Report No. 86-055 and notified the inspector of the deficiency.

March 8, 1986: The inspector met with the licensee Plant Engineering Department representatives. The licensee discussed the investigation scope and findings and provided associated documents for the inspector's review.

The electrical terminations associated with BG-HV-8160 were installed during July 13-14, 1983, in accordance with Bechtel Drawing No. E-27000, Revision 43, which referenced Bechtel Drawing No. E-2R890, Termination Sheet 32. Sheet 32 specified a typical conduit connection.

Bechtel Drawing No. E-27000, Revision 44, was issued July 21, 1983. This revision referenced Termination Sheet 43 which specified the installation of a Conax connector seal assembly. Bechtel Drawing No. E-27000 is a computer listing. Revisions to the list are notated by a (+) preceding the item or document revised. At the time of the revision, design changes were implemented by the licensee's Startup Organization through issuance of Startup Work Requests (SWRs).

In response to the identified EQ deficiency, the licensee's Engineering Department performed an investigation. This investigation included; (1) Conax connectors as identified on SNUPPS Equipment Qualification List dated December 31, 1984; and (2) the review of work authorizing documents to determine the record status of the design change associated with valve BG-HV-8160. The inplant inspection determined that installation of the Conax connectors was in agreement with equipment qualification requirements. No additional EQ deficiencies were identified. The licensee's review determined that no SWR was issued for the installation of the specified Conax connector.

The licensee performed a Failure Modes and Effects Analysis for valve BG-HV-8160. The analysis considered; Hot Short/Shorts to Ground, open circuit, and failure of the solenoid coil. The analysis determined that the above failures would not have prevented the pilot solenoid valve BH-HY-8160 and containment isolation valve BH-HV-8160 from closing. The valve's post accident safety function (Containment Isolation Phase A) would have been satisfied.

The inspector determined that the EQ deficiency associated with valve BG-HV-8160 resulted from the licensee's Startup Organizations' failure to process the required work authorization documents for the installation of the Conax connector. The deficiency, once identified by the licensee was promptly documented, corrected, and thoroughly evaluated. The deficiency appears to be an isolated event (oversight not programmatic). Because of the valve's safety design feature (fail closed), the deficiency is considered of lesser safety significance. However, the licensee's failure to environmentally qualify all electrical equipment by November 30, 1985, according to the provisions of 10 CFR 50.49 is another example of a violation of Callaway Plant Operating License No. NFP-30, Licensee Condition 2.C.(3)(a). No. 483/86007-01b.(DRP)

3. Reportability Requirements of Callaway Operating License NPF-30, License Condition 2.F.

March 11, 1986: The licensee Compliance Department determined that the NRC had not been notified of the EQ deficiencies documented on Incident Report Nos. 86039 and 86055 within 24 hours as required by License Condition 2.F. License Condition 2.F. states, "With the exception of 2.C(2) Union Electric shall report any violations of the requirements contained in Section 2.C, of this license within 24 hours. Initial notification shall be made in accordance with the provisions of 10 CFR 50.72 with written followup in accordance with the procedures described in 10 CFR 50.73(b), (c), (d), and (e)". Section 2.C includes the environmental qualification requirement. Failure to meet the 24 hour notification requirement was documented on Incident Report No. 86-063. The licensee then notified the NRC Operations Center via the Emergency Notification System (ENS).

The inspector discussed with the licensee their initial reportability review regarding Incident Reports No. 86-039 and No. 86-055. The licensee stated that the evaluation was based on Technical Specifications system operability which assumed that the EQ deficiency rendered the system/component inoperable. 10 CFR 50.72 and 10 CFR 50.73 were reviewed to determine reportability requirements. Based on the review, reportability requirements were determined to be a Licensee Event Report (LER) 30 day report in accordance with 10 CFR 50.73. Subsequently, based on a more conservative evaluation of reportability, the licensee made an ENS notification of the event.

The inspector discussed the reporting requirements established by License Condition 2.F. with NRC Region III and NRR staff to determine if the 24 hour reporting requirement was intended to apply to specific violations, programmatic violations or both. The discussions indicated a need for clarification. This matter is unresolved pending NRC review. Unresolved Item No. 483/86007-02(DRP).

No other violations or deviations were identified.

4. Unresolved Items

Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 2.b.(3).

5. 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. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.