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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
RESPONSE TO INSPECTION REPORT 90005; NOTICE OF VIOLATION

Nuclear Regulatory Commission (NRC) Inspection Report 255/90005, dated March 22, 1990 documented the results of an examination of previously identified environmental qualification (EQ) inspection findings and resulted in the issuance of two violations. As was noted in the Inspection Report, we had implemented corrective actions to resolve all findings and concerns with one exception, the electrical penetration connector. In accordance with 10CFR2.201, our response to each of the identified examples of noncompliance follows:

Violation 50-255/90005-03 (DRS):

10CFR50, Appendix B, Criterion XVI, "Corrective Action" requires that measures be established to assure that conditions adverse to quality, including nonconformances, are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action is taken to preclude repetition. The corrective action taken shall be documented and reported to appropriate levels of management.

Contrary to the above, Consumers Power Company failed to assure that the corrective action taken in response to a previously identified EQ Severity Level IV violation was adequate in that the licensee failed to demonstrate the qualification of potted connectors used on Viking electrical penetrations. Insulation resistance (IR) measurements were not taken during the accident portion of the EQ test. These measurements are necessary to ensure that instrument accuracy requirements are met and that low voltage control circuits will perform their safety function during accident conditions.

Reason For Violation

It was previously identified in NRC Inspection Report 255/86032 that the EQ file for potted connectors used on containment electrical penetrations did not

adequately address the effects of IR breakdown on the accuracy of associated instruments under the environmental conditions that could be expected during a loss of coolant accident (LOCA). The basis for this conclusion was that neither insulation resistance nor leakage current test data had been collected during simulated LOCA conditions. Although test data was not available to demonstrate the adequacy of potted connectors during a LOCA transient, test data was available to demonstrate that connector IR values are acceptable both before and after a LOCA, and that the potted connectors which serve EQ circuits will not fail catastrophically during an accident.

In response to this observation, Consumers Power Company elected to qualify the potted connectors to the "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors", November 1979 (DOR Guidelines) by demonstrating that the connectors were manufactured and tested to Military Specification (MIL SPEC) C-5015G, "General Specification for Electrical Connectors, Circular Threaded, AN Type". The intended purpose of demonstrating that the connectors were manufactured and tested to the MIL SPEC was to allow the use of MIL SPEC C-5015G IR breakdown data as a qualification basis. At the time that this qualification method was chosen, we believed that it satisfied DOR guidelines.

Although the information contained in our EQ files provides reasonable assurance that our potted connectors meet MIL SPEC requirements, we are unable to provide documentation that conclusively proves they were manufactured and tested to MIL SPEC C-5015G. As a result, it was concluded by the NRC Inspectors that our use of MIL SPEC IR Breakdown data did not satisfy DOR guidelines, and that the qualification of our potted connectors remained undemonstrated. This lack of conclusive proof has resulted in a decision to replace the potted connectors.

Corrective Action Taken And Results Achieved

We have performed an operability determination for the EQ instrument circuits and control circuits associated with the potted connectors. The results of this operability determination indicate that these connectors are acceptable for use until they can be replaced. This operability determination was transmitted in our letters dated February 6, 1990 and February 7, 1990 and considered the impact of IR breakdown on circuit operation during a LOCA transient. A follow-up response to NRC questions regarding the operability determinations was transmitted in our letter dated February 16, 1990.

Corrective Actions Taken To Avoid Further Non-Compliance

We are currently in the process of replacing the potted connectors that serve EQ circuits with qualified connectors and will update our EQ files to reflect the proper qualification requirements for these connectors.

Date When Full Compliance Will Be Achieved

Replacement of potted connectors and update of the EQ file for these connectors is scheduled to be complete by the end of the 1990 Fall Refueling Outage.

This outage is currently scheduled to begin in September 1990. A detailed summary of our current replacement schedule for the potted connectors was provided in our letter dated March 1, 1990.

Violation 50-255/90005-04 (DRS):

10CFR50.49, Paragraph f, requires each item of electrical equipment important to safety be qualified by testing, or testing and analysis.

Contrary to the above, the licensee identified auxiliary feedwater (AFW) control circuit relays R/0727 and R/0749, located in a harsh environment, that were omitted from the EQ Master Equipment List and consequently not qualified by testing or testing and analysis.

Reason For Violation

We identified that relays R/0727 and R/0749 were installed in junction boxes JL-263 and JL-264 during a walkdown of junction boxes located outside of containment that was being performed in order to identify junction boxes that were susceptible to flooding. The affected relays are installed in safety-related flow indication and flow control circuits for one train of the AFW system. Junction boxes JL-263 and JL-264 are both located in the component cooling water (CCW) pump room, which is classified as a harsh environment, and each contained one relay.

Relays R/0727 and R/0749 were installed in 1982 as an Appendix R modification under Facility Change FC-407-14A. The purpose of this modification was to allow transfer of one train of AFW flow indication and flow control to the auxiliary hot shutdown control panel (C-150) following a fire in the Control Room. Although these relays are located in a harsh environment, they were not added to the EQ list during modification package preparation.

Exclusion of these relays from the EQ list resulted from inadequate administrative control of the modification process, and inadequate communications between the personnel responsible for defining the EQ list and the personnel who prepared the AFW relay modification package. At the time when engineering and field implementation of the Facility Change were being performed, the EQ list for Palisades was in the process of being finalized. Also, Plant modification procedures did not require evaluation of new equipment for potential addition to the EQ list. We concur with the NRC evaluation of this deficiency as an example of noncompliance.

Corrective Action Taken And Results Achieved

An engineering analysis (EA-PAL-90-014-1) has been performed for relays R/0727 and R/0749 in order to determine the potential effects of a harsh operating environment. This analysis reached the following conclusions:

1. Relays R/0727 and R/0749 are normally de-energized and are only energized when AFW flow control and indication are transferred to the auxiliary hot shutdown panel following a fire in the Control Room. A

harsh environment is not postulated in the CCW pump room during this event.

2. A credible failure mechanism could not be identified which would cause relays R/0727 and R/0749 to energize as a result of an adverse operating environmental, and thereby affect Control Room indication and control of AFW flow.

3. The redundant AFW train is fully qualified and does not contain a similar transfer relay installation in its control circuitry.

4. The contacts on relays R/0727 and R/0749 are only used for AFW flow indication and control circuits and could only affect operation of these circuits if the post-to-post or post-to-ground resistance decreased significantly. A comparison of the electrical resistance for these relays and a States terminal block has been performed. The results of this comparative evaluation indicate that the expected decrease in electrical resistance for relays R/0727 and R/0749 under harsh environmental conditions would not result in a significant flow indication or flow control error. The States terminal block was chosen for this comparison because it has been tested and it has a similar base material composition and terminal post configuration as the affected relays.

Based on the results of this engineering analysis, it can be determined that although relays R/0727 and R/0749 are not qualified, their ability to transfer AFW flow indication and flow control to the auxiliary hot shutdown panel following a fire in the Control Room is not adversely affected. This conclusion is primarily based on the fact that harsh environmental conditions would not be expected in the CCW pump room during this event. Additionally, since the relays are de-energized except when AFW flow indication and flow control have been transferred to the auxiliary hot shutdown panel, it is not considered likely that subjecting the relays to a harsh environment would result in any abnormal operability affects during operations when AFW flow control and indication have not been transferred.

We have also performed an evaluation of other circuits that are required to transfer indication and control from the Control Room to the auxiliary hot shutdown panel. The purpose of this evaluation was to determine if there were any other transfer circuitry components that should have been designated as EQ equipment and that were not included on the EQ list. No other transfer circuitry components were identified during the evaluation that should have been designated as EQ equipment.

Corrective Actions To Avoid Further Non-Compliance

We are reviewing our current modification process to determine if it has adequate controls to ensure that new EQ equipment is added to the EQ list. Procedural controls added since the 1982 AFW relay modification require that an EQ evaluation is performed for each modification. This EQ evaluation is reviewed by an individual who is familiar with EQ requirements and provides

assurance that new EQ equipment is added to the EQ list. Additionally, a review is being performed to identify whether other equipment needs to be added to the EQ list as a result of modifications that were performed by outside organizations and installed during the approximate 1981 to 1986 time frame.

We will also perform testing in order to qualify the relay contacts for R/0727 and R/0749 to the requirements of 10CFR50.49(k). This testing will include an evaluation of relay insulation resistance under harsh environmental conditions.

Date When Full Compliance Will Be Achieved

During discussions with NRC Inspectors, we had previously stated that we would complete qualification of relays R/0727 and R/0749 by June 1, 1990. This schedule was predicated on our ability to obtain test data for these relays from other sources. We have been unable to obtain this data and must therefore perform testing in order to obtain the necessary qualification data. As a result, final environmental testing and qualification of AFW relays R/0727 and R/0749 and incorporation of the EQ data into EQ files is now expected to be complete by September 1, 1990. Review of the adequacy of our current modification program EQ controls and of modifications prepared by outside organizations are expected to be complete by June 1, 1990.

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