Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

April 18, 1994

Mr. William Russell, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Zion Station Units 1 and 2
Eagle 21 Process Protection System
Periodic System Performance Reports
NRC Docket Nos. 50-295 and 50-304

References: (a) April 10, 1992 letter from S.F. Stimac to T.E. Murley

Dear Mr. Russell:

Commonwealth Edison Company committed via reference (a) to provide NRC periodic performance reports related to the Zion Eagle 21 Process Protection System. Pursuant to this commitment, please find in Attachment 1 the subject report for Unit 2 for the interval of December 1993 through March 1994. This report represents the final reporting for Unit 2, and as such, fulfills the obligation to provide future periodic reports. However, a follow-up report will be made when the remaining open root causes are completed.

Attachment 2 contains a follow-up report to the Zion Unit 1 Eagle 21 Process Protection System performance reports.

Please direct any questions you may have to this office.

Respectfully,

Terrence W. Simpkin
T.W. Simpkin
Nuclear Licensing Administrator

Attachments

cc: J.B. Martin, Regional Administrator - RIII
C.Y. Shiraki, Project Manager - NRR
J.D. Smith, Senior Resident Inspector - Zion
Office of Nuclear Facility Safety - IDNS

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ATTACHMENT 1

ZION STATION UNIT 2

EAGLE 21 PERFORMANCE REPORT

On January 27, 1994, the AC power distribution panels had been returned from Westinghouse after the failure mode of the capacitor in location C2 had been corrected. Prior to installing the panels in the racks, they were tested to insure that timing relays were set at the proper values. The panel that was slated to be installed in rack 1 of Unit 2, passed its time delay check. When the panel was installed in rack 1, the rack did not energize.

Action Taken: The failed panel was removed from the rack and shipped to Westinghouse for repair. A spare panel was installed in the rack and it functioned as designed by restoring power to the rack.

Root Cause: The failure of the power distribution panel is being attributed to a faulty timing relay in the panel.

On February 20, 1994, steam generator level channels were being placed in bypass to facilitate the performance of a test on Unit 2. When the instrument maintenance technician tried to place the channel LY-538 in bypass, a Channel Set Failure alarm was received in the Control Room. A visual inspection of the Eagle Partial Trip (EPT) board in termination frame 10 revealed it was not operating.

Action Taken: The EPT board in rack 11 termination frame 10 was replaced with a spare board. Once the replacement board was installed the channel LY-538 was able to be placed in bypass. The failed board will be returned to Westinghouse for a root cause analysis. An update will be provided when the results of the analysis are known.

ATTACHMENT 2

ZION STATION UNIT 1

EAGLE 21 PERFORMANCE REPORT FOLLOW-UP

UPDATE

Power Supplies

Unit 1 has experienced approximately four power supply failures since Eagle 21 has been declared operational.

Root Cause: To determine the root cause of these failures, Westinghouse examined several failed power supplies from Zion. They concluded that the failure of capacitors in locations C2 and C7 was the cause of the power supply failures. A closer examination of the capacitors revealed that they were failing as a result of a break down in the dielectric mater. . This premature breakdown was traced to changes in the manufacturing process of the capacitors.

Resolution: To correct this problem, the flawed capacitors were isolated to a lot number, which were then traced to the affected power supplies. The power supplies which were affected by this problem were shipped back to Westinghouse to have the capacitors in locations C2 and C7 replaced with new capacitors. Prior the power supplies being shipped back to the site, they were tested to ensure proper operation. To date, the powe; supplies have been reinstalled and are functioning properly.

ZION STATION UNIT 1

EAGLE 21 PERFORMANCE REPORT FOLLOW-UP

UPDATE

Power Distribution Panels

On September 1, 1993, at 1430 on Unit 1, the L.E.D's on the Multibus status panel for the Test Sequencer Processor (TSP) were cycling on and off in conjunction with the L.E.D for the TSP/Secondary power supply cycling on and off. Further investigation into the problem revealed that the associated AC power distribution panel switch, which was also cycling on and off, was the source of the problem. Subsequent to this initial failure, there were three more failures of AC distribution panels on Unit 1.

Root Cause: To determine the root cause of these failures, Westinghouse examined several failed distribution panels from Zion. The results of the analysis revealed that the failure of the capacitor in location C2 was the cause of the failures. This failure mode was due to a resistor in close proximity to the capacitor generating excessive heat, and causing the capacitor prematurely degrade.

Resolution: To correct this problem, all AC distribution panels were sent back to Westinghouse so that the resistor could be mounted outside of the timing module. This was done to prevent the heat generated by the resistor from over stressing the capacitor, thereby prolonging its service life. To date, all the power distribution panels have been reinstalled in the racks, and are functioning properly.

ZION STATION UNIT 1

EAGLE 21 PERFORMANCE REPORT FOLLOW-UP

UPDATE

TSP

On June 21, 1993, a "Channel Set Failure" alarm was received from Protection Set I on Unit 1. An investigation into the problem revealed that the TSP for rack 3 had halted processing. Several unsuccessful attempts were made to reboot the processor. As a result of this, the TSP board was replaced, and the failed board was returned to Westinghouse for a root cause analysis.

Root Cause: The results of diagnostic testing by Westinghouse did not reveal a problem with the board.

UPDATE

LCP

On July 23, 1993, a "Channel Set Failure" alarm was received in the control room from Protection Set I. The investigation into the problem revealed that the LCP board in rack 2 had halted processing. Several attempts to reboot the processor were unsuccessful. As a result of this, the LCP board was replaced, and the failed board was sent back to Westinghouse for a root cause analysis.

Root Cause: The results of diagnostic testing by Westinghouse did not reveal a problem with the board.