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ILLINOIS POWER COMPANY

CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

Docket No. 50-461

August 7, 1985

Mr. James G. Keppler
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

SUBJECT: Reportable 10CFR50.55(e) Deficiency 55-85-04:
Deficient Welds on Butterfly Dampers Supplied By
Pacific Air Products Company

Dear Mr. Keppler:

On April 4, 1985, Illinois Power Company verbally notified Mr. F. Jablonski, US NRC Region III (Ref. IP memorandum Y-26229 dated April 4, 1985) of a potentially reportable deficiency concerning the indeterminate quality of pipe mounted butterfly dampers supplied by Pacific Air Products Company installed at the Clinton Power Station (CPS). This initial notification was followed by one (1) interim report (Ref: IP Letter U-10274, D. P. Hall to J. G. Keppler, dated May 7, 1985). Illinois Power's investigation of this matter is complete. Our investigation identified, documented and evaluated for adequacy those pipe mounted butterfly dampers that are to be utilized at CPS. Our investigation into this matter has determined that this issue represents a reportable deficiency under the provision of 10CFR50.55(e). This letter is submitted as a final report in accordance with the requirements of 10CFR50.55(e). Attachment A provides the details of our investigation.

We trust that this final report provides you sufficient background information to perform a general assessment of this reportable deficiency and adequately describes our overall approach to resolve this issue.

Sincerely yours,

D. P. Hall
Vice President

ZZ/mea

Attachment

cc: NRC Resident Office
Director, Office of I&E, US NRC, Washington, DC 20555
Illinois Department of Nuclear Safety
INPO Records Center

IE27

ATTACHMENT A

Illinois Power Company
Clinton Power Station

Docket No. 50-461

Reportable 10CFR50.55(e) Deficiency 55-85-04
Deficient Welds on Butterfly Dampers Supplied By
Pacific Air Products Company

Final Report

Statement of Reportable Deficiency/Background

Baldwin Associates (BA) Resident Engineering identified a deficiency with the welds on two butterfly dampers (Ref. Nonconformance Reports (NCRs) 28523 and 28526). The condition involves pipe mounted butterfly dampers installed in the Standby Gas Treatment (VG) and Drywell Purge Air (VQ) ventilation systems. The fillet weld attaching the damper sleeve to the damper flange failed such that the flange pulled away from the damper sleeve during bolting to the mating pipe flange. Butterfly damper 1VG17YB was returned to the Pacific Air Products Co. (PAPCO) on March 26, 1985, for repair or replacement (Ref. NCR 28526). Upon receipt, PAPCO conducted an evaluation and has determined that the cause of the weld failure was lack of adequate fusion of the fillet weld between the flange and the sleeve of the damper (Ref. PAPCO letter from L. R. Hess to R. Riedy [BA Subcontracts], dated April 1, 1985). The quality and adequacy of these dampers to perform their design function was indeterminate.

Investigation Results

Illinois Power Company prepared and implemented an investigation plan to determine the extent of this deficiency at Clinton Power Station (CPS). The investigation plan included:

1. A review to identify the number of pipe mounted dampers supplied by PAPCO utilized in safety-related systems was performed. Of the 27 units that are to be installed at CPS (Ref. Sargent & Lundy [S&L] Specification K-2903, Amd. 7, sublist number 3), 24 are utilized in Seismic Safety Related systems and 3 are utilized in Seismic Non-Safety Related Systems.

2. A review to identify other items/materials supplied by PAPCO was performed. Of 412 duct mounted dampers that are to be installed at CPS, 206 are utilized in Seismic Safety or Seismic Non-Safety Related systems, (Ref. S&L Specification K-2903, Amd. 7 sublist numbers 1,2,4,5,6,7 and 8). The remaining 206 are utilized in Non-Seismic Non-Safety Related systems.

3. A visual inspection of the welds on those items/materials identified in item 2 to determine acceptability was performed.

Corrective Action

On April 9, 1985, PAPCO prepared an Investigation Report addressing the pipe mounted butterfly dampers (Ref. PAPCO Letter from J. P. Dodson to R. Riedy dated April 9, 1985). In this report PAPCO identified that only one weld failed and that a redundant weld on the face of the flange had good penetration and fusion to both the flange and the sleeve of the damper. The summary of the PAPCO report included the following statements:

A) The damper did not fail. The integrity of the unit was never in peril.

B) The fillet weld cracked due to lack of penetration (fusion) between the body and the flange.

C) The specification was complied with and this construction was limited to the Clinton Power Station, (S&L Specification K-2903, Sublist 3) and consisted of 27 dampers.

D) The installation placed excessive strain on the damper.

It was noted within the report that excessive strain had been placed on the flange of the returned damper (1VG17YB) . The flange was bent away from the normal attitude by about 1/8". It was PAPCO's opinion that using through bolts and installing the damper as a "wafer valve" would have been more desirable and would relieve the stress on the damper. This method of installation had not been previously supplied by PAPCO. On July 15, 1985, Field Engineering Change Notice (FECN) 10687 permitting the installation of pipe mounted butterfly dampers using through bolts was issued.

On April 24, 1985, an inspection of the remaining pipe mounted butterfly dampers (total of 26) was performed to identify if the dampers were fabricated with the redundant weld. Of the 26 dampers, 10 dampers were fabricated without this redundant weld which is not required by Specification K-2903 (Ref. Letter Q-04222 from Z. Zizak to 55-85-04 File dated June 10, 1985).

On April 25, 1985, three pipe mounted butterfly dampers (1VQ01Y, 1VQ02Y, and 1VQ03Y) were returned to PAPCO for the repair of the fillet weld between the flange and the sleeve of the damper. The original fillet welds were removed and the dampers were rewelded utilizing the new weld repair procedure, 11-1-RP Rev. 1 (Reviewed and accepted by S&L, Status 2). On April 29, 1985, the remaining 23 pipe mounted butterfly dampers were returned to PAPCO for weld repairs.

Upon return of the first three pipe mounted dampers (1VQ01Y, 1VQ02Y, and 1VQ03Y) from PAPCO to CPS, the repair fillet welds were reinspected for thorough fusion between weld metal and base metal. The results of the reinspection indicated no lack of fusion with the repaired welds. All other welds on these three dampers were reinspected and incomplete fusion was identified on the five fillet welds attaching the stiffeners to the damper blade, (Ref. Letter Y-29851 from R. L. Baldwin to Z. Zizak dated May 17, 1985). Nonconformance report 31211 was initiated reporting this deficiency for 1VQ01Y and 1VQ02Y pipe mounted dampers. This NCR (31211) was evaluated by Illinois Power's Nuclear Station Engineering Department (NSED) and dispositioned use-as-is. All other pipe mounted butterfly dampers will be reinspected by PAPCO and BA Technical Service/IP Vendor Surveillance. This reinspection will consist of reinspecting all repair welds on the pipe mounted butterfly dampers.

Per the recommendation of NSED (Ref. Letter Y-75787 from H. R. Victor to Z. Zizak dated May 22, 1985) a sampling program in accordance with MIL-STD-105D was conducted to visually inspect the welds on seismic/safety and seismic/non-safety related duct mounted dampers. A sample of 48 dampers from the population of 206 duct mounted dampers were inspected to determine that the welds exhibit thorough fusion. This inspection did not identify any welds with lack of fusion, (Ref. Letter Y-26287 from Z. Zizak to R. L. Baldwin dated May 14, 1985, and Letter Y-26299 from Z. Zizak to J. Karr dated May 22, 1985).

Subsequent to the completion of the above sampling program, NCR 31537 was initiated reporting weld defects (incomplete fusion and undercut) on two duct mounted dampers (1VR08YA and 1VR08YB). The excessive undercut was reworked by welding. The area exhibiting lack of fusion was removed by grinding to the extent necessary to eliminate the defect. This grinding did not reduce the weld size below that required by the drawing (the weld removal was less than 1/32" Ref. Zack Q.C. Special Inspection Report of NCR 31537). This condition was evaluated by S&L and dispositioned on the NCR (31537) use-as-is. These duct mounted dampers (1VR08YA and 1VR08YB) were not part of the 48 sampled by the aforementioned program. Had these dampers been included within the 48 sampled, it would not have caused rejection of the sample (Ref. MIL-STD-105D, Table II-A).

To preclude recurrence of this problem, NSED Procedure P.2 "Evaluation of Procurement Sources" will note on form P.2-3 (Technical Evaluation of Vendors) that the welding on PAPCO supplied items will be inspected upon receipt.

Root Cause

The deficiencies identified in this investigation are attributed to a lack of proper implementation of the requirements (base metal cleaning/operator technique) contained within the PAPCO Welding Procedure Specification (Ref. PAPCO Welding Procedure Specification No. 1 Rev. 1, dated September 27, 1977, and the PAPCO Investigation Report).

Safety Implication/Significance

Illinois Power's investigation of this matter is complete. Since the problem was identified as a deficiency in welding of a possible generic nature to all dampers furnished by PAPCO, the evaluation for safety implication and significance included both pipe and duct mounted dampers. PAPCO's Investigative Report summarizes that the pipe mounted dampers have areas where there is no fusion of the fillet weld between the flange and the body of the damper, and that all pipe mounted dampers will have to be repaired. Dampers OVG02YA, 0VG02YB, OVG05YA and OVG04YB are safety related and did not have redundant welds. These dampers are located in the discharge piping of both Standby Gas Treatment System (SGTS) trains. Due to the lack of adequate fusion of the fillet weld between the flange and the sleeve of the damper, the sleeve could deform during a seismic event. Since the dampers are normally closed/fail closed, this could prevent the dampers from opening thus preventing both SGTS trains from operating in accordance with the design. When both SGTS filter trains are inoperable the limits of 10CFR20 and 10CFR100 would be exceeded. Sargent & Lundy's evaluation concluded that these deficiencies represent a condition adverse to the safe operation of CPS (Ref. S&L Letter XHV-85-49 from W.P. McDonald to H.R. Lane, dated June 7, 1985). Illinois Power has reviewed and evaluated the deficiencies associated with this investigation and has concluded that this issue represents a reportable condition under the provision of 10CFR50.55(e).