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ILLINOIS POWER COMPANY



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

October 1, 1984

Docket No. 50-461

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

Subject: Potential 10CFR50.55(e) Deficiency 55-84-19:
Nelson Studs On Embedment Plates

Dear Mr. Keppler:

On August 28, 1984, Illinois Power Company notified Mr. F. Jablonski, NRC Region III, (Ref: IP Memorandum Y-20790, dated August 28, 1984) of a potentially reportable deficiency concerning Nelson Studs on embedment plates which have parted from the back of the plate. Our investigation of this issue is continuing, and this letter is submitted as an interim report in accordance with the requirements of 10CFR50.55(e) (3). Attachment A provides the details of our investigation to date.

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

Sincerely yours,

D. P. Hall
Vice President

RLC/cbs (NRC)

cc: NRC Resident Office, V-690
Director - Office of I&E, US NRC, Washington, DC 20555
Illinois Department of Nuclear Safety
INPO Records Center

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ATTACHMENT A
Illinois Power Company
Clinton Power Station

Docket No. 50-461

Potential 10CFR50.55(e) Deficiency 55-84-19
Nelson Studs on Embedment Plates

Interim Report

Statement of Potentially Reportable Deficiency/Background

Nonconformance Report (NCR) No. 20031 was written to document a condition where an embedment plate on the outside of the drywell wall had pulled away from the concrete (Az 128° el. 753', S&L dwg. S27-1002-03A). To aid in dispositioning of this condition, the concrete was excavated along the edges of the plate to expose the embedded Nelson studs behind the plate. All seven (7) studs in the outer row were exposed. Six (6) of the seven (7) studs were found detached from the back of the plate. A second plate at Az 140° was also excavated and found with two (2) of four (4) exposed studs parted from the back of the plate (NCR 21516). An investigation and evaluation of this issue is being performed to determine the extent of this problem, affect on installed hardware, and significance to the safety of operation of CPS.

Investigation Results/Corrective Action

There are five (5) embedment plates in the drywell exterior wall with similar design. Each of these plates have four (4) vertical rows, each with 7 studs which are attached to the back of the plate. The original design for the beam end connections required clip angles to be welded to the embedment plates. Later it became necessary to modify the end connections. The connections on the embedment plates at azimuth 174°, 157°, 140°, 128° for beam numbers 101, 102, 103 and 104 respectively, were modified per detail 27-290 on drawing S27-1436. This detail requires a 1" x 7 3/4" x 1' - 9" long plate to be welded vertically to the embedment plate using 7/8" fillet welds. In addition a second plate 1" x 1' - 9" long was to be added near the bottom of the embedment plate using a full penetration single bevel weld in the horizontal direction. Nonconformance report 18722 now becomes relevant in this investigation in that it documents that the embedments for beams 101, 102, 103 are out of design location. The locations are off in elevation slightly, and off in azimuth. It was noted from field inspection that the attachments for each of the 4 beams are eccentric to the centerline of the embedment plate. This fact is pertinent when trying to establish the stud failure mechanism. It is postulated that the cause of failure was assymetrical heating causing thermal stress development and plate distortion due to shrinkage of the heavy welds described.

ATTACHMENT A
(continued)

Sargent & Lundy (S&L) has been requested to investigate this hypothesis and estimate the thermal stress levels. This may give insight to the failure mechanism and could establish the bounds of the problem.

The embedment plate at AZ 315° has also been modified from the original detail which required 7" x 4" x ½" clip angles, 1' - 7½" long. The new detail 27-596A on drawing S27-1458 requires 7" x 4" x ¾" angles with a 11/16" fillet weld. This welding and the configuration generally will not cause the weld shrinkage problems postulated on the four previously mentioned plates. It should be noted that general note 4 on drawing S27-1436 requires that the interpass temperature be limited to 350°F when welding to the embedment plates.

The complete scope and root cause(s) of this issue have not yet been identified, such that a determination of remedial and generic corrective action can be made.

Identified discrepancies are being documented on NCRs and will be resolved in accordance with approved site procedures.

Safety Implications/Significance

Illinois Power's investigation of this potentially reportable deficiency is continuing. The safety implications and significance will be assessed after further background information is evaluated. Approximately ninety (90) days will be required to complete the investigation, determine reportability, and file a final report on this potentially reportable deficiency.