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ILLINOIS POWER COMPANY

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

U-10246
February 14, 1985

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 55-84-12: Installation of Concrete Expansion Anchors in Floors with Finishing Slabs

Dear Mr. Keppler:

On June 4, 1984, Illinois Power Company notified Mr. D. Keating, NRC Region III, (Ref: IP Memorandum Y-20647 dated June 4, 1984) of a potentially reportable deficiency concerning the installation of concrete expansion anchors in floors with finishing slabs. This initial notification was followed by two (2) interim reports (Ref: IP letter U-10177, D. P. Hall to J. G. Keppler, dated July 13, 1984; and IP letter U-10214 D. P. Hall to J. G. Keppler, dated October 26, 1984). 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). 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 this issue.

Sincerely yours,

D. P. Hall
Vice President

RLC/cbs (NRC1)

Attachment

cc: NRC Resident Office
Director, Office of I&E, USNRC, 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 55-84-12:
Installation of Concrete Expansion
Anchors in Floors with Finishing Slabs

Interim Report

Statement of Potentially Reportable Deficiency

Baldwin Associates Resident Engineering (BARE) provided Illinois Power Company (IPC) with a list, identifying 129 supports assumed installed on finishing/topping slabs. The concern expressed that the installation of the concrete expansion anchors (CEAs) for these supports may not meet the embedment length as required by the Sargent & Lundy (S&L) Specification.

Background

In February, 1984, BARE provided IPC with a listing of 129 supports installed on finishing/topping slabs. This listing identified the support, the length of the installed anchor, the thickness of the finishing/topping slab, and the amount of anchor installed in rough concrete. Several of the CEAs identified have an effective embedment length of zero (0) inches (i.e., if the thickness of the finishing/topping slab is subtracted from the required effective embedment length).

Specification K-2944 requires the effective embedment length of CEAs to be determined from the surface of the rough concrete.

Illinois Power Company requested that S&L evaluate for adequacy the 129 mechanical component supports identified by BARE. S&L has stated that none of the CEAs associated with the identified installed mechanical supports met the specification requirement for effective embedment.

Of the 129 supports identified, 58 had been installed. S&L evaluated the installed supports for adequacy with regards to design loads (total design basis accident loads), 14 were initially evaluated as inadequate. Subsequent evaluation of the actual installations of these 14 supports determined that ten (10) were adequate to carry design loads (i.e., installed in rough concrete, already reworked with longer bolts, or were part of another support with no anchors of their own) and four (4) are currently being evaluated.

The effective embedment deficiencies associated with these four (4) supports have been documented on Nonconformance Reports (NCRs) and will be resolved in accordance with approved site procedures.

Investigation Results

Illinois Power has prepared and is implementing an investigation plan to determine the extent of this problem at Clinton Power Station (CPS). The investigation plan includes:

1. A review of construction procedures governing the installation/inspection of CEAs was performed to determine adequacy and compliance.

2. Based on the preliminary as-built drawings that were generated, a complete listing of all potentially affected equipment/components was compiled.

3. A complete set of composite as-built drawings was generated which identifies all equipment/components installed on finishing/topping slabs which utilize CEAs for installation.

4. The equipment/components identified by the listing generated in item 2, were entered into the computer in a "search" for all documentation (i.e., NCR, Field Change Request (FCR), etc.) that may have addressed these components. The documents identified by the "search" were reviewed to identify those documents which address the problem of CEA embedment.

5. All components with CEAs that violate the effective embedment criteria and do not have prior approval documentation, are being documented on NCRs and will be resolved in accordance with approved site procedures.

6. At the 825' elevation of the Control Building a waterproof membrane lies between the rough concrete and the topping slab. For this design, the CEAs were not to be installed through the waterproof membrane. NCR 24947 and NCR 24948 document over 73 installations which have penetrated into or through the membrane. Baldwin Associates Quality Control (BAQC) has generated NCRs to document each identified installation violation. These are presently being evaluated by S&L.

ATTACHMENT A

(continued)

Corrective Action

The corrective action taken on this issue to date includes:

1. To aid site personnel in locating finishing slabs, a stencilling program was implemented. The placement of the stencilling is such that individuals involved with installation/inspection of CEAs can easily recognize areas where effective embedment would require additional consideration due to the thickness of the finishing slabs.

2. Baldwin Associates issued Memo MA-31-84, dated June 6, 1984, emphasizing to supervisory personnel the requirement to install CEAs into the structural slab in order to achieve full embedment per S&L Specification K-2944, Form CPS-1-CEA.

3. Several procedures and checklists have been revised to ensure proper installation and verification of the embedment depth:

   a) QAI-710.11, Rev. 2: Concrete Expansion Anchor Checklist, was issued on August 3, 1984, and step V specifically states the term "rough concrete (with no finishing slab)" and adds the formula for concrete embedment with finishing slabs.

   b) BQAI-190-1, Rev. 4: Concrete Expansion Anchors Field Verification, was issued on August 3, 1984, and Exhibit 2, Concrete Expansion Anchor Field Verification Checklist, requires the minimum effective embedment of expansion anchors be based on the amount of anchor length embedded in rough concrete.

   c) BAP-2.16: Concrete Expansion Anchor Work, This has been revised to note the existence of finishing/topping slabs, precautions for accomplishing work, and guidelines for checking anchor embedments.

4. Sargent & Lundy has provided a listing, identifying the Category I finishing/topping slabs at CPS.

5. A review was performed to identify all documents relating to installations utilizing CEAs on safety-related finishing/topping slabs. These documents are being utilized in conjunction with the drawings to establish adequate anchor bolt installation.

6. To date, all 40 required composite as-built drawings of the nine (9) Category I finishing/topping slabs have been generated from the individual discipline oriented preliminary drawings. The as-built drawings identify all installations which have utilized CEAs and are located on Category I finishing slabs. All 40 as-built floor drawings have been finalized and BAQC verified. The BAQC review involves the verification of all CEAs and their dimensional location on the finishing slab.

7. A complete list of installations on the nine finishing slabs has been compiled and all pertinent documentation has been obtained.

8. All installations that are documented as not having been accepted to the present embedment criteria for CEAs have been noted on a finalized set of composite as-built drawings. Baldwin Associates Quality Control is currently initiating NCRs to document each of the remaining embedment violations as identified on the finalized set of as-built drawings.

9. NCRs initiated as result of this investigation will be dispositioned/reviewed by S&L to determine adequacy of the installations to meet design requirements. Those installations requiring rework/repair will be evaluated by S&L for significance to the safety of operations of CPS.

Root Cause

The root cause for the various violations has been attributed to:

1) Misinterpretation of the term "finish Concrete".

2) Inadequate utilization, by site personnel, of available information regarding the location of finishing/topping slabs.

3) Incomplete criteria for expansion anchor embedment depth into finishing/topping slabs, primarily at elevation 825' in the control building where a waterproof membrane exists.

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. It is anticipated that approximately sixty (60) days will be necessary to complete our investigation, determine reportability and file a final report on the matter.