

DMB

ILLINOIS POWER COMPANY



1605-L  
U-10186

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

August 15, 1984

Docket No. 50-461

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

Subject: 10CFR50.55(e) Deficiency 55-84-06:  
Damage to Conax Penetrations

Dear Mr. Keppler:

On March 28, 1984, Illinois Power Company notified Mr. F. Jablonski, NRC Region III, (ref: IP memorandum Y-20509 dated March 28, 1984) of a potentially reportable deficiency concerning damage to Conax cable penetrations through the containment wall. This initial notification was followed by one (1) interim report (ref: IP letter U-10148, D. P. Hall to J. G. Keppler dated April 27, 1984). Illinois Power's investigation of the above issue is complete and has determined that this issue represents a reportable deficiency under the provision of 10CFR50.55(e). This letter is submitted as a final report regarding this reportable deficiency.

Statement of Reportable Deficiency

Inspection of control and instrumentation (C&I) type, as well as low voltage power type cable penetration assemblies identified damage to termination components consisting of: terminal blocks, terminal block cages, feedthrough power conductors, termination enclosures, wire terminations, integration valve, and material corrosion. An evaluation of these items was performed to determine the effects on the integrity of the cable connections and penetration assemblies and the significance to the safety of operation of CPS.

9408300022 840815  
PDR ADOCK 05000461  
S PDR

11  
IE27  
AUG 20 1984

### Background

The penetration assemblies were inspected and shipped from the Conax facility in late 1980 and installed, by Baldwin Associates, in early 1981. The assemblies were inspected and shipped in special packing cases and were installed without protective enclosures over the termination cages. In mid-1981, the enclosure covers were installed over the termination cages, but did not fit properly over the terminal cage. An inspection of one of the installed penetration assemblies led to the discovery of bent terminal studs and broken barriers on terminal blocks. As a result, IP decided to perform a preliminary inspection of all NSSS and BOP control and instrumentation penetration assemblies for possible damage.

### Investigation Results

Illinois Power prepared and implemented an investigation plan to determine the extent of this problem at CPS. The investigation plan included:

1. A review was made of all Nonconformance Reports (NCRs) written against Conax penetrations to classify the reported damage into specific areas for IE and non-IE applications. The effect on safety for each type damage was evaluated.
2. A review of the Conax Installation Instruction Manual and Baldwin Associates installation and inspection procedures was performed to determine adequacy and compliance.
3. The Baldwin Associates work travelers were reviewed to verify that the vendor's recommended procedures were followed.
4. The Conax Corporation was consulted to determine the effect of the damage to the penetration assemblies and proper means of correcting the damage.
5. The Baldwin Associates procedures for inspection and termination of field cables to the penetrations were reviewed to determine quality hold points prior to connecting cables.
6. Field verification methods for assurance of equipment integrity were evaluated with respect to identifying damage prior to turnover of the penetration assembly.

During the investigation, all installed C&I type Conax penetrations were inspected for damage. As a result of all NCRs written against the Conax penetration assemblies, 23 types of damage/deficiencies were identified. The identified damage/deficiencies were categorized into seven (7) categories as follows:

1. Terminal Blocks
2. Terminal Block Cages
3. Feedthrough Power Conductors
4. Termination Enclosures
5. Wire Terminations
6. Integration Valve
7. Nozzle Flange Corrosion

Nonconformance Reports (NCRs) were generated for all identified damage/deficiencies. The NCRs are being resolved in accordance with approved site procedures.

#### Investigation Analysis

Electric penetration assemblies provide a means for carrying electrical circuits through apertures of the Reactor Building, while maintaining the integrity of the pressure barrier. The penetration assemblies prevent radioactive leakage outside the containment. A portion of these electrical circuits is provided to ensure the safe shutdown capability of the reactor. In order to determine the appropriate corrective action to be taken, all identified damage/deficiencies, as well as the cause of the identified damage/deficiencies, were analyzed.

The majority of deficiencies identified were incidental to the main problem of damaged terminal blocks on the C&I penetration assemblies. These problems were caused primarily by improper fitting of the penetration enclosures and use of the assembly terminal block cages as a stepping support by construction craft personnel during construction activities associated with cable tray installation. The cable tray installations have been completed and all penetration enclosures have been properly installed to preclude recurrence of these problems.

#### Corrective Action

All control & instrumentation (C&I) and low voltage power penetrations are currently installed and there are no other electrical penetration assemblies to be procured. Appropriate measures are being taken to improve existing procedures to preclude recurrence of similar damage/deficiencies during future replacement operations.

A total of 118 NCRs were written against installed Conax penetrations. Of the 118 NCRs written, 81 are closed and the remaining NCRs are currently in the process of being worked.

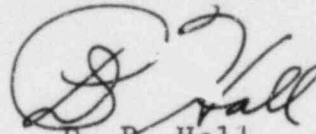
The penetration assemblies are inspected utilizing the inspection procedure of the quality control instruction for electrical equipment. Since the penetration assembly is a combination of electrical and pneumatic (sealant) equipment, a specific inspection checklist will be issued to combine the pertinent requirements of the quality control instructions for electrical equipment and electrical cables and include checkpoint indications relative to the penetration itself (welding, electrical and mechanical components, corrosion, etc.). This inspection checklist will be performed prior to the turnover of the penetration assemblies. In addition, IP Startup testing will be performed on these assemblies following turnover.

Safety Implications/Significance

Illinois Power has evaluated the various types of damage/deficiencies for safety significance to the safe operation of CPS. Our evaluation has determined that the damage to the terminal blocks, were it to have remained uncorrected, could have affected adversely the safety of operation of CPS. On this basis, the issue is considered to be reportable under the provisions of 10CFR50.55(e).

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

Sincerely yours,



D. P. Hall  
Vice President

RLC/lag (NRC2)

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