DMB

ILLINOIS POWER COMPANY

1605-L
U-10167

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

July 6, 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 55-83-06
Structural Steel Welds by Rockwell Engineering

Dear Mr. Keppler:

On April 27, 1983, Illinois Power Company verbally notified Mr. F. Jablonski, U.S. NRC Region III, (ref: IP memorandum Y-17046, 1605-L, dated April 27, 1983) of a potentially reportable deficiency per 10CFR50.55(e) concerning vendor shop welding deficiencies on certain structural steel members supplied by Rockwell Engineering. This initial notification was followed by four (4) interim reports (Ref: IP letter U-10060, D. P. Hall to J. G. Keppler dated May 31, 1983; IP letter U-10085, D. P. Hall to J. G. Keppler dated August 31, 1983; IP letter U-10110, D. P. Hall to J. G. Keppler dated December 9, 1983; and IP letter U-10135, D. P. Hall to J. G. Keppler dated March 15, 1984). As a result of our prior investigation, this issue was determined to represent a reportable deficiency under the provisions of 10CFR50.55(e). This letter is submitted as a final report, in accordance with the requirements of 10CFR50.55(e)(3).

Statement of Reportable Deficiency

Vendor shop welding deficiencies were identified on certain structural steel members supplied by Rockwell Engineering (structural steel fabricator) to Baldwin Associates (CPS contractor) for installation at Clinton Power Station (CPS). The structural steel members in question are columns used to provide lateral support for concrete block walls at CPS.

JUL 11 1984

IE27
1/0

Background/Investigation Results

During on-site modifications to a block wall support column by Baldwin Associates, a deficient weld was found that was made by the structural steel fabricator. The deficient weld was one of three used to attach a connection angle to the column. The column was being modified per a Field Change Request (FCR 17033) which, in part, required removal of the connection angle. Inspection of the deficient weld revealed that there was no fusion with the base metal. An investigation was initiated to determine the scope of this problem.

A review of the applicable purchase order was performed and those columns received with unmodified welded connections were identified. This review identified fifty-eight (58) columns. An inspection by Baldwin Associates Technical Services was performed and fifty-seven (57) columns were found to contain welding deficiencies, varying from cosmetic to potentially structurally significant. Deviation Reports (DR) 5815 and 10303 were generated to document the welding deficiencies identified by the inspection.

To evaluate the root causes of potential welding deficiencies, and to eliminate cosmetic deficiencies identified during the inspection, the welds on twenty-two (22) erected columns were field ground to sound metal and then reinspected. This second inspection provided detailed information and sketches of the remaining welds for on-site evaluation. The thirty-five (35) columns that were not installed were returned for evaluation and were repaired in the vendor's shop. The evaluations indicated a trend in inadequate connection angle welds parallel to the column flanges on 6" and 8" columns. This trend was caused by lack of accessibility to properly position the electrode during welding of the connection angles. As a result of this adverse trend, the scope of the investigation was increased to address all safety-related blockwall columns to assure adequacy in meeting design requirements.

Corrective Action (Interim)

1) In-process installation work on the subject blockwall columns was discontinued until further investigation of this potential deficiency was performed and the columns repaired.

2) Blockwall columns that were not installed were returned to the vendor for repair in accordance with approved welding procedures. Baldwin Associates Vendor Surveillance personnel witnessed a representative sample of column weld inspections and repairs.

3) Blockwall columns installed at CPS that are accessible have been inspected and are being repaired as necessary. Those which are not accessible for inspection

and repair have been referred to the Architect Engineer for an engineering evaluation and disposition.

4) Welding deficiencies noted during the random inspection are being documented on Nonconformance Reports (NCRs) and the members are being repaired or reworked by Baldwin Associates.

5) Where possible, Illinois Power and Baldwin Associates have constrained future orders of structural steel to include only stock material. Fabrication of required members will generally be performed on-site by Baldwin Associates and stock material will be used. This action has resulted in minimum purchases of shop-fabricated structural steel assemblies.

6) Structural steel vendors performing work or supplying material for CPS (past and present) were notified that they will be held responsible for their work. This includes correctness of design, proper completion of work, implementation of QA/QC programs, and reportability in accordance with the Code of Federal Regulations.

7) Since the affected members were received, enhancements have been made to the Baldwin Associates vendor surveillance and receipt inspection programs. These enhancements include the following:

   a) intensified in-shop vendor surveillances in both scope and number.

   b) a reevaluation of Baldwin Associates vendor surveillance inspection/receipt inspection points was performed, with more hold/inspection points established.

   c) to increase overall program effectiveness, a reorganization of the Baldwin Associates vendor surveillance group from the Quality Control to the Quality Assurance Department was made.

Corrective Action (Final)

PHASE I

All installed safety related blockwall support columns which have the potential for weld deficiencies have been identified and tabulated in a Historical Matrix. Of the total identified, 362 columns are inaccessible. S&L has evaluated the 362 inaccessible columns and reported that;

1) 100 of these 362 inaccessible columns are acceptable as-is, even if no weld exists between clip angle and column.

2) The 262 remaining columns will be made acceptable by implementation of one of the following options:

   a) For only those columns determined by S&L to require rework, inspect welds and rework those determined to be deficient.

   b) Perform detailed modifications provided by S&L upon issuance of "approved for construction" drawings.

   c) A combination of options a & b as appropriate to the circumstance of each column.

The Historical Matrix will be used to document and status the implemented corrective action for each applicable column.

PHASE II

In addition to the support columns identified above, 369 "other" steel members were supplied by Rockwell. Of this total, a random 20% sample size was intended to be inspected. 64 structural steel members were inspected and the number of deficiencies found and evaluated by S&L made it unlikely that acceptance criteria could be met. Therefore, based upon S&L's recommendation, 100% of all Rockwell "other" steel will be inspected and deficiencies analyzed for acceptance as-is or reworked.

The Historical Matrix will be used to document and status the implemented corrective action for each applicable "other" steel member.

In summary, all aspects of the Rockwell shop fabricated structural steel welds have been investigated and evaluated. Appropriate corrective measures are being implemented based on the analysis and recommendations of the Architect Engineer (Sargent and Lundy).

Safety Implications/Significance

The blockwall columns in question provide lateral support for concrete block walls at CPS. It can be postulated that the shop welding deficiencies on blockwall columns could adversely affect the performance of the block walls under seismic loading conditions and impact the safe operation of CPS, and is considered to be reportable pursuant to 10CFR50.55(e).

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

Sincerely yours,

D. P. Hall
Vice President

RLC/cah

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