

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-461/80-06

Docket No. 50-461

License No. CPPR-137

Licensee: Illinois Power Company
500 South 27th Street
Decatur, IL 62525

Facility Name: Clinton, Unit 1

Inspection At: Clinton Site and S&L, Chicago, IL

Inspection Conducted: April 14-18, and 21-22, 1980

Inspectors: *H. M. Wescott*
H. M. Wescott, RIII

5-15-80

E. J. Gallagher
E. J. Gallagher, RIII

5-16-80

G. F. Maxwell
for G. F. Maxwell, RII

5-15-80

J. H. Neisler, RII *John H. Neisler*

5-16-80

Approved By: *R. C. Knop*
R. C. Knop, Chief,
Projects Section 1

5-16-80

Inspection Summary

Inspection on April 14-18, and 21-22, 1980 (Report No. 50-461/80-06)

Areas Inspected: Routine announced mid-term QA inspection of safety related construction activities: purchasing, control maintenance and storage of purchased material, site quality records, quality assurance program activities, design control activities, document control activities, and audit activities. The inspection involved a total of 192 inspector-hours by four NRC inspectors.

Results: Of the seven areas inspected, four items of noncompliance were identified (infractions - measures not established for control of purchased material - measures not established to provide quality control of identified structures - measures not established to assure that certain purchase items conform to procurement documents), (deficiency QA program not audited periodically).

DETAILS

Persons Contacted

Illinois Power Company

*B. Blackburn, Manager, Power Production
*G. M. Brashear, Manager, Clinton Site
*A. J. Budnick, Director, QA
*E. E. Connon, Assistant Director of Construction
R. Follock, Civil QA Engineer
*J. D. Geier, Manager, Generation Engineering
*W. C. Gerstner, Executive Vice President
***J. F. Hampton, Construction QA Supervisor
*L. J. Koch, Vice President
*J. O. McHood, Vice President
*T. F. Plunkett, Operations
***J. S. Spencer, Director, Design Engineering
M. O. Tindill, Construction QA Engineer
R. Weber, Civil QA Engineer

Baldwin Associates

*W. H. Harrington, Project Manager
G. R. Larson, Electrical Engineer
J. Line, Manager
*T. Selva, Manager Quality and Technical Services

Sargent and Lundy

**L. E. Ackman, Director of Services
**A. Gillis, Senior QA Coordinator
**W. G. Hegener, Manager Mechanical Department
**R. C. Heider, Project Manager
**D. C. McClintock, Manager Electrical Department
**J. M. McLaughlin, Manager Structural Department
**P. A. Nevins, Senior Electrical Project Engineer
**D. K. Schoofer, Mechanical Project Engineer
**A. J. Skale, QA Coordinator
**J. M. Stoka, Project Director
**H. S. Taylor, Assistant Head, QA Division
**R. A. Witt, Senior Structural Project Engineer

General Electric Company

*S. G. Hall, Quality Control

U.S. Nuclear Regulatory Commission RIII

*G. Fiorelli, Chief, Reactor Construction and
Engineering Support Branch

*R. C. Knop, Chief, Projects Section 1

*H. H. Livermore, Resident Inspector (Clinton)

*Denotes those attending the exit interview on April 18, 1980 at Illinois
Power Company Offices in Decatur, Illinois.

**Denotes those attending the exit interview on April 22, 1980 at Sargent
and Lundy Offices in Chicago, Illinois.

***Denotes those attending both of the above exit meetings.

Section I

Prepared by: J. H. Neisler

Reviewed by: C. C. Williams

1. Purchasing

The inspector reviewed procurement manuals, procedures, requisitions, and purchase orders relating to the procurement of safety related goods and services for the Clinton Nuclear Power Plant.

- a. The procurement manual and procedures describe the actions to be accomplished in the preparation, review, approval, and control of procurement documents. Procedures also include the requirements for documented test results, inspection and acceptance requirements, and special instructions such as material identification, cleaning, packing, and shipping.
- b. Procedures require purchase orders to contain technical requirements, specification codes, drawings, and industrial standards. The procedures require purchase documents to include records which the supplier must submit, prepare, maintain, or make available for review such as drawings, specifications, procedures, procurement documents, inspection and test records, personnel and procedure qualifications, and material, chemical and physical test results.
- c. The inspector reviewed completed purchase orders and purchase orders in process for procurement of civil, electrical and mechanical materials and components and concluded that procurement activities were in accordance with the site procurement manual and procedures.

No items of noncompliance or deviations were identified in this area of the inspection.

2. Control, Maintenance and Storage of Purchased Material

- a. The inspector reviewed procedures applicable to the receipt, storage, and maintenance of safety related materials and components used in the construction of the Clinton Nuclear Power Plant.
- b. Receipt inspection procedures contain the inspection requirements of ANSI N45.2 Section 8 and ANSI N45.2.2 Section 5 such as inspection for fire damage, excessive exposure, environmental damages, rough handling and tie down damage, and documenting evidence that items are in compliance with the applicable codes standards and purchase specifications.

c. The inspector noted that the scope of Procedure BAP 2.4, Storage and Maintenance, ended with the turnover of an item from the contractor to the owner. At present there are no procedures in effect to provide for surveillance and maintenance of safety related equipment from the time of turnover until the equipment becomes operational at fuel loading. Licensee representatives at the exit interview stated that the necessary procedures were being written and would be in effect before any equipment was turned over to the owner. This matter is unresolved pending publication and review of the above procedures.
(5(50-461/80-06-01))

d. During review of Procedure BAP 2.4, Storage and Maintenance, it was noted that the procedure was inadequate in that provisions were not included for the preservation and maintenance of equipment that has been stored in-place or issued from warehousing and installed in the plant.

The lack of procedural requirement for the preservation of material and equipment is contrary to the requirements of 10 CFR 50, Appendix B, Criterion XIII and Illinois Power Company Quality Assurance Manual Chapter 13 Section B. This is an item of noncompliance as identified in Appendix A of the report transmittal letter. (50-461/80-06-02) Infraction.

3. Site Quality Records

The inspector reviewed documentation pertaining to electrical installation and inspection activities. This review included work packages, travelers, inspections for the installation of electrical raceways, and hangers, and qualification records for QC inspectors. Travelers and work packages appeared to comply with applicable procedures in effect at Clinton.

The inspector reviewed the QC inspector training program. Training and qualification requirements are established in the Baldwin Associates Quality Control Training/Qualification Manual. Review of training and qualification records for QC inspection personnel indicate that personnel are being trained and qualified in accordance with the training and qualification and ANSI N45.2.6.

No items of noncompliance or deviations were identified in this area of the inspection.

Section II

Prepared by: E. J. Gallagher

Reviewed by: D. W. Hayes, Chief,
Engineering Support Section 1

Illinois Power Company Clinton Station "Mid Term" QA Audit

An audit of Illinois Power Company control of their contractors and suppliers of material was performed in the civil/structural area relative to the program requirements of 10 CFR 50, Appendix B, Criterion II (quality assurance program), Criterion III (design control), Criterion VI, (document control) and Criterion VII (control of purchased material).

1. Quality Assurance Program Activities

A review of Illinois Power Company quality assurance program activities was performed to ascertain that adequate QA control has been provided over the civil/structural contractors and suppliers. The following IP audit reports of concrete, reinforcing steel, and soils activities were reviewed and determined to provide adequate surveillance of the work activities:

<u>Audit Report Nos.</u>	<u>Audit Report Nos.</u>
Y-10588	Y-10727
Y-10658	Y-1026
Y-10674	Y-10683
Y-10679	Y-10682
Y-10688	Y-10660
Y-10700	Y-10656
Y-10702	
Y-10731	

Drawings and specifications relating to safety-related structures were reviewed to verify that the correct designation of Category I was identified and that the quality assurance organization provides surveillance of the associated work activities. During this review, it was identified that drawing S-20-1004, Revision B, Settlement Monitoring Program was designated as Non-Category I and that site QA had not provided control over the monitoring program. This program is used to verify that the foundations for safety-related structures are providing their intended function and are performing within the estimated design basis for settlement between structures.

This is considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion II (quality assurance program) in that IP quality

assurance has not provided control over settlement monitoring program due to the incorrect designation of Non-Category I. The inspector also identified to the licensee that the monitoring program was being performed every two months, while Drawing S-20-1000 indicates the frequency to be once a month. (50-461/80-06-03)

No response to the above item is required since during the course of the inspection, IP reclassified the monitoring program as Category I with QA to provide surveillance. In addition, the inspector reviewed previous settlement monitoring reports for November 1979 and January 1980 performed by H. L. Chastan Company which indicated settlement to be well within the established design criteria. H. L. Chastan Company was also identified as a qualified vendor in accordance with ANSI N45.2 in August of 1975.

Except for the above item of noncompliance, Illinois Power Company appeared to have adequate quality assurance control over the civil/structural work activities.

2. Design Control Activities

During the "Mid QA" audit, an inspection of the design organization (Sargent & Lundy Engineers) was performed to verify that adequate design controls were in effect on the Clinton project and in accordance with ANSI N45.2.11 (Design Control). The inspection verified that measures were established for the identification and control of design interfaces and verification or checking the adequacy of design.

The following design calculations were verified to be in accordance with S&L QA Procedure GQ-1.08, Revision 4:

- a. Containment Structural Design Criteria DC/SD-03-CO, Revision 5 issued July 21, 1978; the material properties specified were in accordance with FSAR Section 3.8 Criteria.
- b. Structural Design Criteria for Blockwalls DC-SD-01-CO, Revision 3, issued May 10, 1977 including Calculation No. SDQ11-21DG02 for hollow core and solid block masonry walls. Calculations for block walls were being performed in accordance with SD & DD Report No. 25, Concrete and Brick Masonry.

The following specifications for the Clinton project were verified to be in accordance with procurement specification requirements of S&L Procedure GQ 4.01 Revision 8, specifically with respect to review and approvals, issuance, and revision approval.

- a. K-2942 Earthwork Specification

- b. K-2944 Concrete Specification
- c. K-2949 Miscellaneous Structural Steel and Embedded Work.

A review of Illinois Power Company's reportable deficiency (10 CFR 50.55(e)) regarding usage of incorrect soil characteristic value as design input to dynamic models for response spectra development was made at the design organization with respect to design controls.

Safety Relief Valve (SRV) discharge analysis calculations SDQ1270AS02 Revision 0 were performed on August 31, 1977. These calculations were reviewed on September 9, 1977 and later approved on February 3, 1978 without identifying that the incorrect soil characteristic was inadvertently used. On January 14, 1980, during preparation of another dynamic model for a different analysis, the error was identified on Page 20 of 28 in that the material property for compacted structural fill was entered on the calculation sheet as 62.5×10^3 KSF (62,500) instead of 6250 KSF, a factor of ten from the correct value. The incorrect value was also transferred to the computer input and used for the dynamic analysis. On February 29, 1980, S&L notified Illinois Power Company of the error after preliminary assessment of the effects of the input error. The NRC Region III office was also notified of this potential reportable deficiency on February 29, 1980.

It was determined during this review the adequate design controls were in effect when the original calculations were performed, reviewed, and approved, but simply, the incorrect entry in the calculation was not identified. Other incorrect entries on previous calculation sheets were identified and corrected during the design review process.

The following reports associated with the above design errors were reviewed:

- a. Report Y-5016, dated March 24, 1980, report by Illinois Power Investigating Committee on S&L usage of incorrect soil characteristic value.
- b. Letter SLS-I-2535, dated March 25, 1980, Sargent & Lundy letter to Illinois Power Company regarding reportability of soil modulus error.
- c. Report SLMI-4557, dated April 8, 1980, summary report on use of incorrect soil property in analyses for responses to hydrodynamic force.

No items of noncompliance or deviations were identified in this area of the inspection.

3. Document Control Activities

The inspector verified that measures had been established and implemented to control issuance of documents such as procedures and drawings, including changes (field changes and engineering changes) which preclude activities affecting quality. The following drawings were in use on site by construction personnel:

<u>Drawing No. and Revision</u>	<u>Drawing No. and Revision</u>
052 R00	220 R1
227 R1	230 R0
228 R1	231 R1
221 R0	E26-1002-01A-EIH (RA)
051 R0	E26-1002-01A-EIT (RA)
050 R00	E26-1002-04A-EIT (RA)
226 R2	E05-1980 (RC)
222 R1	E05-1982 (RC)
224 R1	E05-1984 (RA)
225 R1	E05-1987 (RA)

The above drawings were verified to be the most current issue of the design document with associated filed changes and engineering change notices clearly marked on the documents.

During the audit, the same drawings were to be verified to be in use in the A/E organization (Sargent & Lundy Engineers). The latest revision was available, however, no apparent indication of outstanding open changes were indicated on the drawing. In addition, no system to correlate outstanding field changes to shop and fabrication drawings (i.e. Baldwin and Bristol Structural Steel drawings) in the design organization was in effect.

This item is considered unresolved pending licensee review of the system to keep current shop drawings in possession of the design organization. (50/461-80-06-04)

No items of noncompliance or deviations were identified in this area of the inspection.

4. Control of Purchased Material

The inspector chose procurement Specification K-2949, "Miscellaneous Structural Steel and Embedded Parts", to evaluate Illinois Power Company's control of purchased material. The specification included appropriate codes and standards with the AWS D1.1 welding code applicable to embedded plates with studs.

During an inspection of the embedded plates received on-site and accepted by Baldwin Associates receiving inspection, the following deficiencies were identified:

- a. Automatic machine welded studs that were repaired by manual welding had not been bend tested as required by Specification K-2949 Section 303.4M7.1.1 and AWS D1.1 Section 4.30.1.
- b. Studs on embedded plates had been bent greater than the maximum permitted 30 degrees. Specification K-2949, Section 303.4M7.4 states, "In no case shall the angle of a bent stud exceed 30 degrees". Studs were observed to be bent greater than 45 degrees and isolated cases of 90 degrees.
- c. Studs on embedded plates were observed to be broken off or cracked at the weld. Specification K-2949, Section 303.4M.7.3.2 requires, "Bent headed studs that crack in the weld or base metal shall be removed and replaced."
- d. Studs were observed not to have a full 360 degree weld flash and were not bend tested in accordance with AWS D1.1 Section 4.3.1. Specification K-2949, Section 303.4M7.1 requires, the vendor shall visually inspect 100% of the Category I headed studs for full 360 degree fillet weld or flash.

Baldwin Associates Receiving Instruction #C17261 for Receipt Inspection of Rockwell Engineering Company miscellaneous steel and embedded plates requires the inspector to verify the following characteristics conform to the specified requirements: (1) physical properties, (2) dimensions (3) weld preparation and (4) workmanship. It was determined that the receipt inspector had not been supplied a copy of the specification for embedded steel.

This item is considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion VII, in that Illinois Power Company contractor Baldwin Associates has not provided adequate control of purchased material (embedded steel) to assure conformance with specification requirements. (50-461/80-06-05)

During this inspection, Baldwin Associates shop surveillance reports of Rockwell Engineering Company were reviewed. Report C-5710.1 (April 15, 1977), .3 (May 9, 1977), .15 (February 1, 1978) and .19 (May 18, 1978) had indicated repaired studs were not bend tested as required. In addition, Report C-5710.22 (August 22, 1978) required 76 items to be returned for not meeting the requirements of AWS D1.1. Based on the above observations made on material in storage on site and recurring deficiencies identified by Baldwin surveillance reports, adequate corrective action to preclude recurrence, has not been taken by Illinois Power Company.

One item of noncompliance was identified in this area of the inspection.

Section III

Prepared by: H. M. Wescott and G. F. Maxwell

Reviewed by: R. C. Knop, Chief,
Projects Section 1

1. Audits - Illinois Power Company

- a. The inspectors evaluated two utility management audits which were conducted on IPC (April 17-20, 1978 and April 30, 1979); two IPC audits of S&L (November 6-8, 1979 and April 18-20, 1979) and three IPC audits of BA construction activities (October 9-12, 1978, April 11-14, 1978 and September 1-20, 1977). The purpose of the evaluation was to determine if the audits were planned, scheduled, documented and tracked as required in IPC QA Manual Chapter 18 and ANSI N45.2.12 Part 3, Revision 4.
- b. The inspectors evaluated the IPC audit schedules for 1979 and 1980 and discussed, the site activities being directed by General Electric (G.E.) personnel with the licensee. The inspectors were informed that a formal audit of G.E.'s site activities will be conducted in June or July 1980. The inspectors observed that some G.E. site personnel have been located at the Clinton project since October 1978. After discussing, with the licensee, the activities which have been directed by G.E.; neither the inspectors nor the licensee personnel could determine whether or not G.E.'s site activities have been conducted in accordance with the applicable site QA Program requirements. The inspectors were shown several IPC surveillance reports which indicated that the assigned IPC QA representative has been observing work that G.E. is directing (work on the reactor vessel internals being conducted by Reactor Controls Inc. - (R.C.I.)).

The inspectors reviewed some of the checklists which the assigned G.E. site representative has been utilizing to assure that R.C.I. work activities are acceptable and determined that R.C.I.'s work has been in progress for 13-14 months. Further review of G.E.'s records indicated that there was a corporate audit of R.C.I. site activities conducted on or about May 17, 1979. The site audit records, which G.E. retains as evidence of the audit of R.C.I., did not contain sufficient objective evidence to indicate the thoroughness of the audit. The NRC inspectors were informed that the concern for objective evidence will be evaluated by the licensee during their next

audit of the G.E. NSSS corporate office. This matter is considered unresolved. (50/461-80-06-06)

- c. The inspectors also established that a formal annual audit, required by ANSI N45.2.12, had not been conducted of G.E. Co. site activities to verify the implementation of the applicable elements of their QA program which is contrary to 10 CFR 50, Appendix B, Criterion XVIII; IPC PSAR Chapter 17, page 17.1-18; therefore ANSI N45.2.12, Draft 3, Revision 4, Section 3.4.2. This item is considered to be a deficiency. (50/461-80-06-07)
- d. The inspectors reviewed approximately 20 Clinton Power Station Weekly Audit Surveillance Reports that were randomly selected from 1978, 1979, and 1980 files. These reports reflected findings that had been made. In certain instances, there was no apparent documented follow-up action to assure close out of the findings. However, this problem had been recognized by the licensee and Quality Assurance Instruction Q-11, "Construction Quality Assurance Surveillance and Reporting", Revision 1, dated February 29, 1980 requires that conditions adverse to quality be documented on "Illinois Power Company Quality Assurance Audit Surveillance Finding" Form Q7-1. It appears that since Revision 1, to Q-11, Form Q7-1 is being implemented. The inspectors requested that previous audit/surveillance plan reports be reviewed to assure that findings are followed up and corrective action be documented where applicable. This item is considered unresolved pending review of previous weekly surveillance reports and follow-up action taken where required. (50/461-80-06-08)

2. Audits - Baldwin Associates (B.A.)

The inspectors evaluated two BA audits of the HVAC contractor (audit reports E-125 and E-134); one BA audit of site electrical activities (audit report I-137); two BA audits of site civil activities (audit report I-127 and I-087) and two BA audits of site document control (audit reports I-075 and I-073). The purpose of the evaluation was to determine if BA audits are planned, scheduled, conducted, and tracked as required by IPC QA Manual Chapter 18 and ANSI N45.2.12 Draft 3, Revision 4.

No items of noncompliance were identified in this area of the inspection.

3. Design and Design Changes

- a. The inspectors selected 17 design drawings which were being used at various work locations (civil, electrical and mechanical drawings). The drawings were checked against the site document control drawing lists and S&L's document control drawing list.

The drawings were found to be of the most current revisions, with one exception. Drawing RH9 (Southwest Fabricating and Welding Co., Inc.) Revision 6B was being used by an installer, the most current revision to the drawing (Revision 7A) had not yet been distributed to the field activity. The inspector observed that the work being completed was not effected by Revision 7A of the drawing, the drawing had been transmitted to the drawing control center for its distribution only five working days prior to the inspectors observation. Prior to the site exit meeting, the most current revision to Drawing RH9 was distributed to the workers (distributed April 17, 1980). This appeared to be an isolated case. This inspector has no further questions about this matter.

- b. The inspectors selected and tracked through the S&L system three nonconformance reports (NCR's), ten field change requests (FCR's), and twelve engineering change notices (ECN's). As a result, the inspectors observed:
 - (1) S&L drawing revisions include the subject nonconformance reports, field change requests and engineering change notices as required.
 - (2) S&L specifications, as required, are being revised to include the outstanding engineering change notices (reviewed Specification K-2910).
 - (3) The log book, kept by the S&L Project Coordinator, reflects the current status (open/closed, comments) of the project NCR's, FCR's, and ECN's as required by S&L Procedure PI CP-003.
- c. The inspectors evaluated S&L specifications numbered K-2976 and K-2910. The specifications were compared with the requirements of S&L Procedure GQ 4.01, the IPC PSAR Chapter 17.1.3.3.4 and Chapter 8.0 Page 8.1-7 (IEEE 308) and IPC QA Manual Chapters 3 and 4.

Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in Section I paragraph 2.c., Section II paragraph 3, and Section III paragraph 1.b. and 1.d.

Exit Interview

The inspectors met with licensee representatives (denoted under Persons Contacted) at the conclusions of the inspection of the Clinton Power Station at Illinois Power Company Office in Decatur, Illinois on April 18, 1980 and at the Sargent and Lundy Offices in Chicago, Illinois on April 22, 1980. The inspectors summarized the scope and findings of the inspections. The licensee acknowledged the information.