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

REGION III

Report No. 50-461/79-03

Docket No. 50-461 License No. CPPR-137

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

Facility Name: Clinton Nuclear Power Station, Unit 1

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: April 10-12, 1979

Inspectors: T. E. Vandel 5/17/79

H. M. Wescott 5/17/79

F. C. Hawkins 5/17/79

C. C. Williams 5/17/79

Approved by: R. C. Knop, Chief 5/17/79
Projects Section

Inspection Summary

Inspection on April 10-12, 1979 (Report 50-461/79-03)
Areas Inspected: Routine unannounced inspection with facility turnover to newly assigned Project Inspector; follow-up of previously identified Noncompliance matters and unresolved items; review of Licensee and Contractor vendor auditing program and implementation; review of containment concrete placement activities and records; review of Protective Coatings QA implementing procedures and quality records. The inspection involved a total of 80 inspector-hours onsite by four inspection.
Results: Of the five areas inspected, one item of noncompliance was identified (infraction, failure to properly control tools used in activities affecting quality.)

DETAILS

Persons Contacted

*L. J. Koch, Vice Pr. dent
*J. O. McHood, Vice President
*J. D. Geier, Manager Generation Engineer
*G. M. Brashear, Manager Clinton Site
*R. Canfield, Supervisor of Construction
*R. S. Unks, Quality Assurance Supervisor
*J. F. Hampton, Quality Assurance Supervisor, Site
*E. P. Barganier, Construction Supervisor
*E. E. Connon, Assistant Supervisor, Construction
L. Dozier, Engineer
*G. N. Motsegood, Engineer
*B. F. Kacer, Quality Assurance Engineer
*M. D. Tidwell, Quality Assurance Engineer
D. Wilson, Quality Assurance Engineer

Other Personnel

*W. J. Harrington, Project Manager Baldwin and Associates (BA)
*T. Selva, Manager Q&TS, (BA)
*B. G. Carson, Manager Technical Services, (BA)
*J. R. Hilding, Quality Assurance Manager, (BA)
*J. Linehan, Quality Control Manager, (BA)
*P. Bryant, Project Engineer, (BA)
*J. Smart, Senior Quality Assurance Engineer, (BA)
*T. F. Walker, Senior Quality Control Engineer, (BA)
*C. Winfrey, Quality Control Engineer, (BA)
*D. Smither, Engineer, (BA)
*M. J. King, Hartford Steam Boiler Company
R. H. Martina, Quality Assurance Auditor Engineer, (BA)
R. Beeker, Quality Control Inspector, (BA)
R. Glover, Storekeeper, (BA)
K. Rademacher, Supervisor, U. S. Testing Company
D. Heckenberger, Batch Plant Superintendent, (BA)

*Denotes those attending the exit interview held at the conclusion of the inspection on April 12, 1979.

Other licensee and contractor personnel were contacted during the course of the inspection.

Licensee Action on Previous Inspection Findings

(Open) Unresolved Item (461/78-06-1): Cable tray resistance spot welds not protected from the environment. The licensee has committed to write a procedure to clean and coat the exposed resistance spot welds and sheared ends of the cable tray with a zinc rich paint to prevent further deterioration. This is to be accomplished on cable tray that is to carry safety related cable. In addition, the cable tray that is cleaned and coated will be documented. The inspector has reviewed test data for sixteen (16) sections of cable tray that was performed by Burndy/Husky in accordance with NEMA VE-1 3.01. This data was reviewed by Sargeant and Lundy and found acceptable and that, ". . . . the trays will provide strengths consistent with the Clinton project tray support design.", per letter, SLS-I-1695, dated February 8, 1979, Project No. 4536, Files No. 1.1 and No. 5.33.9, to Illinois Power Company.

This item remains open pending the licensee providing a documented program for coating the resistance spot welds and sheared ends on cable tray carrying safety related cable with a zinc rich paint.

(Closed) Unresolved Item (461/78-07-01): The inspector identified inconsistencies in the calibration certificates for tong type ammeters. Review of Baldwin Associates. External Audit Report No. E-096 of Industrial Service Laboratories dated January 22, 1979, established that action had been taken to correct the inconsistencies, in that "Mr. . . . . agreed that future calibration data record results (voltage gradients) and the values as read by the Tong Tester and Weston Calibrators would be reported, as well as the AC/DC Full Scale Accuarcy, Percentiles would be entered on Certificates of Calibration . . . ."

(Open) Unresolved Item (461/78-07-02): A documented program to control welding machines has not been developed. Discussion with Baldwin Associates welding personnel established that a program was being developed. This program was not completed during this inspection. This item remains open pending the licensee's approval of a documented program and the inspectors verification that the program is being implemented.

(Closed) Followup item identified in NRC letter, dated March 9, 1979. The inspector reviewed Baldwin Associates vendor audits, Illinois Power Company's Clinton Power Station Field Quality Assurance Reports No's. 32 through 36, and "Clinton Power Station Field Quality Assurance Weekly Surveillance Plan".

(Closed) Noncompliance (50-461/78-05-10): Previously identified, the cadwelding operators failure to follow the specified procedure. The licensee's corrective action as identified in IPC letter dated August 31, 1978, included additional "Instruction and Training" in the implementation of the controlling procedure No. 3.1.5. Review of the QC surveillance records, and examination of existing cadwelds indicates that the cadwelding performance meets the requirements relative to the use of wicking material.

Although records pertaining to additional training for cadweld operators were not available, the reported oral directions have apparently been effective.

(Closed) Noncompliance (461/78-05-11): As previously identified, a cadweld was accepted although the porosity apparently exceeding the specified acceptance criteria. The licensee's response letter dated August 31, 1978, stated in context that the manufacturer changed the cadweld acceptance criteria. Documented evidence of this change was not available at the site. However, the subject cadweld has been removed. The governing S&L specification and cadwelding procedures have been revised to reiterate the acceptance criteria specified by the cadweld manufacturer. It is on the basis of these specification and procedural changes that this item is resolved.

(Closed) Noncompliance and Unresolved Item (461/78-05-12 and 13): As previously reported, improper storage and maintenance of cadwelds and splice equipment was identified. Subsequently, the licensee has been established, and is successfully enforcing additional storage and protection procedures (i.e., B.A.P No. 5.3.1). Observation of cadweld storage areas and installed but unfired sleeves, did not disclose any discrepancies.

(Closed) Noncompliance (461/78-06-14): As previously reported cadweld sleeves and reinforcing steel were fitted and awaiting firing, although the spacing requirements between rebar ends, was not in compliance with requirements. The licensee's reponse dated August 31, 1978, indicated that the specific condition was corrected, but added that the work was not complete and final "fitting" of the reinforcing steel had not occurred. NRC letter dated September 29, 1978, informed the licensee that this matter would be re-examined and that if proper controls to preclude incorrect spacing were established, this item of noncompliance would be retracted.

During this inspection each detail of this matter as documented in inspection Report No. 461/78-25-14, was reviewed with the licensee's

QA and QC inspector. Each detail was verified to be correct. Therefore, this item of noncompliance as previously documented will not be retracted. The reported corrective actions taken by the licensee relative to the identified cadweld splice were verified.

(Open) Unresolved Matter (461/78-05-15): The Baldwin procedure No. B.A.P. 3.1.5, requires reinforcing steel installation inspection in accordance with the governing specification. This specification, No. K-2944, includes cadwelding reinforcing steel end spaces or "gauge" requirements. However, this attribute is not specifically verified and documented by QC inspections prior to making a cadweld. Assessment by the inspector of the cause for cadweld rejections at this site, indicated that 10-20% of all rejections are caused by failure to meet rebar end gap or Gauge, requirements. It appears that an inspection of this quality attribute by QC inspection and clear documentation of this activity is required. It is not now being done.

The licensee's representatives proposed several procedural changes to correct and resolve this matter. The NRC inspector expressed concern for the extensive time (10 months) it has taken the licensee to address and adequately resolve this issue. The licensee acknowledged these remarks. The corrective action taken to resolve this matter will be examined during a subsequent inspection.

(Closed) Noncompliance (461/78-05-16): As previously reported documentation for new welds on license NCR's No. 1165, No. 834, and No. 1187 indicated that these were repair welds and the required NDE had not been accomplished. The licensee's corrective actions identified in IPC letter dated August 31, 1978, and NRC letter dated September 29, 1978 was verified to have been implemented and continues to be inforced. This matter is resolved.

(Closed) Unresolved Item (461/78-05-17): As previously reported the documented acceptance criteria for cadweld porosity was apparently not clearly understood by the QC inspectors who used it. Subsequently the licensee has revised the procedure (B.A.P 3.1.5) to clearly contain the provisions of the S&L specification. These instructions are a reiteration of the cadweld manufacturers published acceptance criteria although it is apparent at this time that other instructions may be required by the licensee in this regard, this matter as previously reported is considered resolved.

Prepared by F. C. Hawkins

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

1. Observation of Containment Structural Concrete Work and Review of Related Quality Records (Unit 1)

On April 10, 1979, the inspector observed in progress concrete work for placement No. CT-W-10. The Unit 1 containment wall, placed to elevation 685, contained approximately 324 cubic yards of concrete. The placement was under way when the inspector arrived onsite and subsequently, only a partial preplacement inspection could be performed. The following specific observations were made.

a. Placement Preparation

(1) Review of the Concrete Pour Traveler confirmed that all Mechanical, Piping, Electrical, and Civil/Structural requirements had been met and signed off by the responsible QC inspector prior to commencement of the placement.

(2) Form work which was accessible, was observed to be properly cleaned and prepared for concrete placement.

(3) Reinforcing steel was observed to be free of excessive rust, mill scale, concrete, or other contaminants.

b. Delivery and Placement

(1) Concrete Mix Design No. 230-L4090-P03 was specified and delivered to the placement area.

(2) Concrete was pumped to the placement area and then deposited via concrete drop chutes which adequately confined the concrete with a maximum five foot free fall.

(3) Concrete was consolidated using internal vibrators specified by Construction Specification K-2944, Section 304.6(f) to have a minimum frequency of 8,000 vibrations per minuted (vpm). Licensee personnel stated, that vibrators are presently chosen randomly every 3 months for verification of the 8,000 vpm in accordance with Baldwin Associates (BA) Calibration Instruction No. 004. Review of the calibration records revealed that approximately twenty vibrators have been verified from the time construction started until the present. Further, the licensee stated that this number represented about the ten percent or less of the total number of vibrators used to date.

On April 12, 1979, the inspector verified that none of the three vibrators (Serial Nos. 62192, 62194, and 62195) used to consolidate concrete in placement No. AW-6-1 had ever been checked to verify the minimum 8,000 vpm required.

The licensee was advised that, this failure to assure that tools used in activities affecting quality are properly controlled so that accuracy is maintained within the limits specified, through either manufacturers certification for each vibrator and periodic random calibration or verification at time of use, is considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion XII. (461/79-03-01)

(4) The inspector observed that three BA QC Civil inspectors were present at the placement to assure proper concrete placement and consolidation.

c. In-Process Concrete Testing

(1) United States Testing field QC personnel performed slump, temperature, percent entrained air, unit weight tests, and cast compressive strength cylinders as follows:

Ticket No.	Slump (in.)	Temp. (^{o}F)	% Ent. Air	Cyl. No.	Unit Weight (pcf)
40148	6 1/2	66	5.1	-	-
40159	6	58	4.9	CL-1276-1	-
40164	5 1/4	58	5.1	-	-
40169	5 1/4	59	5.0	CL-1276-2	-
40177	5 3/4	61	5.6	-	-
40187	5 3/4	55	5.2	CL-1276-3	139.3
40191	5 1/4	58	5.6	CL-1276-4	-

All test results were within the allowed limits and performed at the frequencies specified.

(2) Concrete was observed to be sampled in accordance with ASTM C172-71 and tested in accordance with the applicable ASTM designation for each test performed.

(3) Concrete test equipment was calibrated and properly marked to indicate calibration status as follows:

Equipment No.	Calibrated	Due
Air Meter AM-6	12/8/78	6/8/79
Scale SC-8	12/6/78	6/6/79
Slump Core ESL-8	1/29/79	4/29/79
Thermometer TE-141	12/18/78	6/18/79

(4) Field curing boxes suitably equipped to maintain the freshly cast compressive strength cylinders at the initial curing temperature specified by ASTM C31-69 were inspected.

(5) The inspector reviewed the training and qualification records of four U. S. Testing QC field technicians and determined that each met the requirements of ANSI N45.2.6.

d. Batch Plant

(1) Volumetric batching devices and scales for the main batch plant were observed to be calibrated and adequately tagged to indicate calibration status.

(2) The central mixer NRMCA certificate was reviewed by the inspector and found to be in current status.

(3) The central and truck mixer uniformity tests performed March 19 and March 20, 1979 respectively, met the requirements of ASTM-C94-74.

e. Review of Concrete Material Quality Records

The inspector reviewed manufacturer/supplier certified material test reports and in-process test reports for selected concrete constituents. In conjunction with this quality record review, the inspector reviewed the indoctrination and training records of four BA QC receiving inspectors and found each to meet the requirements of ANSI N45.2.6.

(1) Aggregate - In-process fine and coarse (3/8") aggregate test results (Samples No. 4737 and No. 4738) for moisture content (ASTM C566), seive analysis (ASTM C136), and material finer than No. 200 sieve (ASTM C117), were reviewed and found to conform to the job specification parameters.

(2) Cement (Type II) - The inspector reviewed the Lehigh Portland Cement Company CMTR for Silo 55A dated March 16, 1979 and found the test results to conform to the standard chemical and physical tests required by ASTM C150-70.

U. S. Testing in-process test report for sample No. OFO-318 was reviewed and found to conform to the standard chemical and physical tests required by ASTM C150-70. The in-process test sample frequency was verified to be every 1,200 tons as specified in ASTM C183.

(3) Liquid Admixtures

(a) Type A - Water-Reducing Admixture - The inspector reviewed the manufacturer's CMTRs for Pozzolith 300-N, Lots No. DP286Q9 and No. DP042Z8, and determined that the material received met the requirements of ASTM C494-77.

U. S. Testing in-process test results for Pozzolith 300-N, Samples No. OFO-316 and No. OFO-319 were reviewed and found to conform to ASTM C494-77 and the job specification.

(b) Air Entraining Admixture - Manufacturer's CMTRs for MB-AE-10, Lots No. DV170X7 and No. DV01957, were reviewed and found to meet the requirements of ASTM-C260-74.

(4) Water and Ice - In-process test results for water and ice samples conformed to the physical tests ASTM C151, C191, and C109 as required by ANSI N45.2.5-74, Table B.

Except as noted, no items of noncompliance were identified.

2. Review of QA Implementing Procedures - Protective Coatings

Midway Industrial Contractors (MIC) is performing the protective coatings work at Clinton Power Station. The MIC scope of work presently includes containment wall embedments, liners, various structural members, concrete surfaces in the Reactor Building and various other service Level I areas. QC surveillance/inspection of coating activities is performed by both a BA QC inspector and a MIC QC inspector.

The inspector reviewed selective MIC QA/QC Coating Procedures and BA QC Coating Procedures to verify the inclusion of application and inspection requirements specified in Illinois Power Company Contract Specification K-2895.

During the review, the inspector noted that neither the MIC QA/QC Procedures, the BA QC Procedures, nor Specification K-2895 specified the frequency of wet film thickness (WFT) inspection to verify dry film thickness (DFT) of completed concrete protective coating work. The licensee stated that no Service Level I concrete coating work has or will be performed, pending revision of the applicable MIC and BA QA/QC protective coating procedures to include inspection frequency for concrete WFT. The inspector will verify resolution of this matter during a future inspection. (461/79-03-02)

No items of noncompliance were identified.

3. Review of Protective Coatings Quality Records

a. Qualification of Personnel - The inspector reviewed the qualification and training records of the BA protective coatings inspector and determined that they met the requirements of ANSI N45.2.6.

b. Coatings Service Level I Checklist Records - The inspector reviewed the coating checklist records Nos. 1 through 9 for the containment drywell wall completed work and observed that the BA coatings inspector had verified the applicable check points.

No items of noncompliance were identified.

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. An unresolved item disclosed during the inspection is identified in Section I, Paragraph 2.

Exit Interview

The inspectors met with licensee and contractor representatives (indicated in the Persons Contacted paragraph) at the conclusion of the inspection on April 12, 1979. The inspectors summarized the purpose and scope of the inspection and the resulting findings.