

U. S. ATOMIC ENERGY COMMISSION
REGION I
DIVISION OF COMPLIANCE

Report of Inspection

CO Report No. 247/68-1

Licensee: CONSOLIDATED EDISON COMPANY,
INDIAN POINT NO. 2
LICENSE NO. CPRR-21
CATEGORY A

Date of Inspection: February 27 and 28, 1968

Date of Previous Inspection: November 29-30, 1967

Inspected By G. L. Madsen 4/1/68
G. L. Madsen, Reactor Inspector (Date)

Reviewed By: N. C. Moseley 4/1/68
N. C. Moseley, Sr. Reactor Inspector (Date)

Proprietary Information: No X Yes _____ Pages None

SUMMARY

The repair of a previously reported containment liner bulge problem has been resolved. Two additional areas do not meet specifications. Proposed corrective actions are being reviewed by Westinghouse, Chicago Bridge and Iron, and United Engineers and Constructors. Cadweld splicing of reinforcement bars has been producing satisfactory results since the adoption of a revised forming and inspection procedure. Three five-foot lifts of concrete have been poured for the containment building.

The concrete quality continues to be acceptable. The batch plant has certain shortcomings which are being controlled through extensive quality control efforts. The use of an admixture to the concrete for the containment building was questioned.

Blasting at IP-3 is in progress. Control mechanisms presently being applied are acceptable.

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DETAILS

I. Scope of Visit

The Consolidated Edison Company (Con Ed), Indian Point No. 2, (IP-2), site, was visited on February 27 and 28, 1968 by Mr. G. L. Madsen, Reactor Inspector, Region I, Division of Compliance. The visit included:

- A. Tour of the construction site
- B. Review of quality control records
- C. Review of dynamite blasting at the site
- D. Review of corrective actions taken relative to a containment liner bulge

Discussions were held with the following:

A. Con Ed

Mr. J. A. Prestele, General Superintendent
Mr. A. Corcoran, Site Construction Engineer
Mr. P. Leo, Site Construction Engineer Assistant

B. Westinghouse

Mr. Homer Deakman, Project Superintendent

C. United Engineers and Constructors (UE&C)

Mr. Earl Nagle, Project Superintendent
Mr. James Fant, Quality Control Supervisor

II. Results of Visit

A. General Construction Status

1. Containment Building

The erection of the containment liner is essentially complete. Three five foot lifts of concrete have been poured. Cadweld splicing of reinforcement bars has

provided satisfactory results. The polar crane support wall is 95% complete. The polar crane is in place and should be operable soon. Erection of the reinforcement for the concrete surrounding the reactor vessel is in progress.

2. Turbine Building and Heater Bay

Fabrication of the turbine condensers is in progress. Five of the six condensate heaters have been received and are in place. The 6900 and 480 volt switchgear has been installed. Installation of general piping and electrical trays continues.

3. Screen Well

Building construction is basically complete. Fabrication of the recirculating water lines between the screen well and turbine building is in progress.

4. Fuel Handling and Storage

The building enclosure is basically complete. Installation of the stainless liner for one of the fuel pits is nearly complete.

5. Primary Auxiliary Building

The final addition to the building is being erected. Some minor components have been received and are being installed.

6. Tanks

Fabrication of the primary and refueling water tanks has been started. Chicago Bridge and Iron is the fabricator.

7. Transformer Area

Installation of the electrical conduits between the transformer area and the switchgear room is nearing completion.

8. Steam Generators

Two steam generator supports have been fabricated and are scheduled for movement to the containment building. Magnetic particle checking of field welds will be performed once the supports have been placed in the final position.

B. Containment Liner

As previously reported*, a bulge in the containment liner was repaired by mechanical jacking and installation of a strong back on the exterior surface of the vessel. Con Ed submitted a report** to DRL, which defined the problem and corrective action. The review, by DRL, revealed no additional complications; hence, the problem is considered resolved.

Discussions with Mr. Corcoran and Mr. Fant revealed that two additional areas of the liner do not meet the specification which limits diameter deviations to ± 2 inches, between elevations 43 and 95 feet. These conditions are being reviewed to determine the appropriate corrective action.

Upon inquiry, Mr. Fant informed the inspector that measurements are being taken on the liner as concrete pouring proceeds. No deformations have been noted as a result of the concrete. The two additional distorted areas are at elevations which will permit concrete pouring of four additional five-foot lifts.

C. Cadweld Splices

As previously reported,**the problem associated with a reduction in cadweld strengths, in June of 1967, was resolved by a research program, corrective actions, and adoption of a new procedure for formation and inspection of cadweld splices. A review of test results, since the last inspection, revealed that one splice, out of 216 randomly selected and tested splices, had an ultimate strength of less than 75,000 psi. This splice failed at 71,250 psi. In accordance with procedure, the splice formed prior to this

*CO Report No. 247/67-4, paragraph II, B, 1.

**Report to DRL from Consolidated Edison Co., dated January 1968

***CO Report No. 247/67-4, paragraph II. C.

splice was removed. The ultimate strength for this splice was greater than 75,000 psi. The average weekly ultimate strengths for the period November 20, 1967 to March 1, 1968 ranged from 90,120 to 98,950 psi. Cadweld splicing on the containment vessel is about 40% complete.

D. Concrete

1. Test Cylinders

A review of test cylinder results indicated that the concrete poured, since the last inspection, had compressive strengths, for 28 day curing, in excess of the 3000 psi design specifications. The average compressive strength encountered was about 3800 psi and the lowest recorded value was 3356 psi.

2. Batch Plant Specifications

The batch plant operation specifications were reviewed. The specifications provide references to the appropriate American Concrete Institute (ACI) and American Society of Testing Materials (ASTM) Standards. Vacca Testing and Research Company has been employed to design mixes, test materials for concrete, test check mixing at the batch plant and concrete pouring at the site, and to obtain test cylinders. Pittsburgh Testing Laboratory performs the compressive strength tests. The batch specification outlines the requirements for materials, design of concrete, batching of materials, mixing of concrete, placing of concrete, and concrete testing. The original specification contained a five inch maximum slump. Experience revealed a desire to go to a seven inch slump for the containment vessel. The concrete mix was designed by Vacca and received the approval of the UE&C Engineering Department.

3. Batch Plant

The inspector and Mr. Fant toured the batch plant. The plant is located about two miles from the Indian Point site. The inspector noted that the facility was an old plant and does not contain some of the newer completely automated

features. Receipt and storage of materials appears to be acceptable. Devices for proportioning of batches are available but are dependent upon operator action. The inspector asked Mr. Fant if he had any reservation about the ability of this batch plant to produce consistently acceptable concrete. Mr. Fant indicated that he felt that the batch plant was somewhat short of optimum; but felt that with appropriate surveillance by Vacca, they have been able to maintain quality. Additional discussions revealed that the batch plant operation has been a continuing area of concern. For this reason, UE&C Quality Control people have been making numerous spot checks of the batch plant performance and Vacca Testing coverage. In addition, U. S. Testing (UST) has conducted spot quality control audits for Con Ed. A review of UST reports, revealed that observations at the batch plant and job site indicated a generally acceptable level of performance. On one occasion a Vacca plant inspector was at the batch plant but no sieve analysis of aggregates was made. All parties were made aware of the need for this information by the inspector to enable knowledgeable judgment as to the acceptability of the materials. The condition appears to have been corrected.

A review of records revealed that a "placewell" admixture was added to the concrete for the containment vessel. The inspector pointed out that the safety analysis placed certain limitations on use of admixtures. The inspector requested a chemical composition of the admixture. The information was not immediately available. Mr. Corcoran agreed to pursue this information and will relay it to the inspector for consideration.

E. Quality Assurance Program

A meeting was held with Messrs. Corcoran, Leo, Deakman, and Fant to discuss the compliance program relative to quality assurance of the plant components. The discussions revealed that the procurement of off-site components is handled by Westinghouse, and that records, relative to off-site fabricated vessels and components, are being maintained by Westinghouse in Pittsburgh, Pennsylvania.

The inspector indicated a need to review the component records to permit a compliance evaluation relative to the requirements of the construction permit. The inspector also expressed his desire to review the information on a piece-meal basis as components arrived rather than waiting till the plant was near completion. The general attitude was that this approach would be most desirable by all parties.

After considerable discussion, Messrs. Deakman and Corcoran agreed to pursue this subject and would endeavor to make the required information available to the inspector at an early date. The inspector indicated that if visits to the Westinghouse Engineering office were required, that no major problem would be anticipated on the part of the inspector.

Additional discussions revealed that on-site fabrication quality control is principally under the direction of UE&C. Mr. Fant relayed his plans and methods of data collection. No apparent problem areas were revealed.

F. System Components

Various system components are beginning to arrive at the site. Items presently on hand include: four emergency cooling accumulators, two primary charging pumps, and five condensate heaters. The status and tentative receipt schedules for some major components are as follows:

1. Primary Pumps - Fabricated and awaiting shipment.
2. Steam Generators - Two to arrive about March 4, 1968 and two to arrive about April 22, 1968.
3. Reactor Vessel - Hydrostatic Testing by Combustion Engineering is scheduled for March 29, 1968. The vessel is scheduled to arrive at the site about June 3, 1968.
4. Pressurizer - Scheduled to arrive about June 3, 1968.

The barge landing area is being prepared for the receipt of large reactor components. The landing is about one mile from the IP-2 site and a somewhat difficult path exists between the landing and IP-2. The inspector plans to monitor the movement of some of this equipment, during future visits.

G. Welding Practices and Control

Discussion with Mr. Fant and a review of existing records concerning welding practices revealed the following:

1. Welders are obtained through local labor pools and are required to be qualified according to ASME Boiler and Pressure Vessel code requirements.
2. UE&C maintains records for all welders. These records contain welder's qualifications, types of material each welder is qualified to weld, and welding process the welder is qualified to use.
3. Radiographs of on-site UE&C welds will be maintained at the site and will be available for review.

H. Blasting

Production blasting at Indian Point No. 3 (IP-3) has begun. The inspector reviewed prints which outlined the various blasting load bands. The inspector questioned the adequacy of vibrational monitoring as was previously discussed*. Specifically, the inspector indicated a reservation with respect to the IP-1 chemical systems building. As a result, a program was initiated to continue taking vibrational information for all blast at the IP-1 conventional building and nuclear service building as originally planned*. In addition, periodic vibrational information will be obtained using a third Sprengnether seismograph instrument at the chemical systems building and the gas turbine pad of IP-1. Information collected to date has revealed no unplanned conditions. The effects of this blasting will be reviewed during all future visits.

*CO Report No. 247/67-4, paragraph I.F.1.

I. Management Interview

Separate management interviews were held with Messrs. Prestele and Corcoran at the conclusion of the visit. The following were discussed:

1. Containment Liner

The inspector indicated that no apparent complications existed with respect to the liner bulge repair. The existence of two additional questionable areas was discussed. Mr. Corcoran stated that he would keep the inspector informed as to the planned corrective action.

2. Cadweld Splicing

The inspector discussed the finding relative to cadweld splice quality and indicated that the previously encountered problem appeared to be under control.

3. Concrete

The inspector indicated two areas of reservation with respect to the quality control of the concrete. The first area is in conjunction with the batch plant. Both parties indicated an awareness of the limitations of the plant and the need for close surveillance by Vacca, UE&C, and Con Ed. Mr. Corcoran indicated that he feels that satisfactory quality concrete is being procured. The second item was in relation to the use of a "Placewell" admixture to the concrete for the vessel containment. Mr. Corcoran agreed to procure the chemical composition of this material for the inspector.

4. Quality Assurance Program

The results of the meeting, relative to the compliance program for the reactor systems and components, were discussed. Mr. Prestele indicated that he would endeavor to establish a means by which the required information would be made available to the inspector.

5. Blasting

The inspector reviewed the finding relative to the IP-3 blasting. Mr. Corcoran indicated that a spot vibrational check at the chemical systems building would be continued throughout the blasting at IP-3.

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