

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

Report of Inspection

CO Report No. 247/68-5

Licensee: CONSOLIDATED EDISON COMPANY
Indian Point No. 2
License No. CPRR-21
Category A

Dates of Inspection: September 27 and 30, 1968
and October 8, 1968

Dates of Previous Inspection: June 17, 18 and 19, 1968

Inspected by: G. L. Madsen 10/17/68
G. L. Madsen, Reactor Inspector Date

Reviewed by: N. C. Moseley 10/17/68
N. C. Moseley, Senior Reactor Inspector Date

Proprietary Information: None

SUMMARY

The containment liner has been deemed dimensionally acceptable to the 190 foot elevation.

Cadweld splicing and compressive strengths of concrete have been satisfactory.

The polar crane rail replacement is about 95% complete.

Most of the major components have been received. The reactor vessel is inside the containment building and placement of two steam generators in their final position is eminent.

Field receipt inspection has revealed cracks in one section of safety injection system stainless piping procured from Dravo.

Component storage of some of the large major items is deemed to be marginally acceptable and will require additional followup.

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The fuel loading schedule has slipped to January of 1970, mainly as a result of the shortage of available boilermakers.

Site preparation and initial construction is proceeding at Indian Point No. 3.

The electrical cable sizing design criteria were reviewed.

DETAILS

I. Scope of Visit

The Consolidated Edison Company (Con Ed), Indian Point No. 2 (IP-2) site was inspected by G. L. Madsen on September 27 and 30, 1968. Messrs. D. Whitesell and F. Cantrell of the Region I, Compliance Division, accompanied the inspector. The visit included:

- A. Tour of the construction site.
- B. Review of construction schedules.
- C. Review of the polar crane rail crack problem.
- D. Review of quality control records.

In addition, Mr. Madsen visited the Con Ed Engineering Offices on October 8, 1968, to discuss electrical cable sizing design criteria.

The principal persons contacted during the visit included:

Con Ed

Mr. J. A. Prestele, General Superintendent

Mr. A. Corcoran, Site Construction Engineer

Mr. P. Leo, Site Construction Engineer Assistant

Mr. J. Grob, Assistant Mechanical Plant Engineer

Mr. F. Fisher, Electrical Engineer

Westinghouse

Mr. Don Larsen, Project Superintendent

Mr. Glynn Waldrop, Quality Assurance Engineer

Mr. Emile Sagan, Engineer, Component Design

United Engineers and Constructors (UE&C)

Mr. James Fant, Quality Control Supervisor

Mr. Robert Phelps, Mechanical Quality Control

Mr. Frank Franchuck, Welding Foreman

U. S. Testing

Mr. Ed Dodson, Quality Control Inspector

II. Results of Visit

A. General Construction Status

1. Containment Building

Cadweld splicing of reinforcement bars continues to be satisfactory and has progressed to the 191 foot level. Concrete has been poured to the 108 foot level. The polar crane rail replacement is basically complete. (Section E). The four steam generator supports are nearing completion. The reactor vessel has been moved to the containment building in preparation for final installation.

2. Turbine Building

Fabrication of the turbine condensers has been detained as a result of a boilermaker shortage. The turbine rotors and generator installation is in progress.

3. Intake Building

Installation of the traveling screens is nearing completion. The six recirculation pumps and three recirculation pump motors have been installed.

4. Fuel Handling and Storage Facility

The installation of the pit liner has been halted by the shortage of boilermakers.

5. Primary Auxiliary Building

The installation of the various components is progressing rapidly. Major items such as the charging pumps have been enclosed and heating lamps have been installed.

6. Transformer Area

The unit auxiliary transformer and two station service transformers are in place.

7. Tanks

Field fabrication of the condensate, primary, and refueling storage tanks is nearly complete.

8. Schedule

The reactor loading date has been changed to January, 1970, as a result of recent meetings between Westinghouse and Con Ed. The shortage of boiler-makers has altered the critical paths and presently the controlling items included the following:

- a. Reactor vessel installation.
- b. Steam generators installation.
- c. Primary pumps installation.
- d. Primary pipe welding.

- e. Primary system cleanup.
- f. Primary system hydrostatic testing.

B. Containment Liner

Measurements and evaluations of the containment liner diameters to elevation 190 feet have been completed and accepted by UE&C, Westinghouse, and Con Ed. Based on available correspondence and records, the inspector considers the containment liner to be dimensionally acceptable to elevation 190 feet. Similar measurements of the containment dome are planned prior to placement of concrete. This activity is presently being delayed by a shortage of boilermakers.

C. Cadweld Splicing

A review of test results, since the last inspections, revealed that the minimum ultimate strength encountered was 84,000 psi and the average weekly ultimate strengths for the period June 24, 1968 to September 16, 1968, ranged from 87,625 to 101,600 psi. The quality of the splicing operation continues to be acceptable.

D. Concrete

1. Test Cylinders

A review of test cylinder results for concrete poured since the last inspection revealed that compressive strengths, for 28-day curing, exceeded the 3000 psi design specification. The average compressive strength was about 3700 psi and the lowest recorded value was 3410 psi.

2. Batch Plant

The previously reported* batch plant problem, associated with the use of crushed stone aggregate instead of the

*CO Report No. 247/68-3, Paragraph II.D.2.

normally used gravel, was reviewed. Correspondence between the batch plant operator, Vacca, Westinghouse, UE&C and Con Ed indicates that a change to an approved crushed aggregate design mix accompanied the change in aggregate used. The correspondence also indicated that even considering the possibility that the change in aggregate was not accompanied by a mix change, the mix reportioning is minor and there still should be no concern with regard to structural adequacy. The inspector feels that adequate steps have been taken to assure structural integrity and the subject is considered to have been resolved.

The batch plant is a continuing area of concern.* For this reason UE&C, Con Ed, and U. S. Testing (UST) have been making numerous spot checks of the batch plant performance and the Vacca Testing and Research Company (Vacca) coverage. Discussion with appropriate personnel and a review of the UST reports of inspection revealed no additional noted deficiencies. Based on this review, the inspector believes the batch plant operation is presently satisfactory.

E. Polar Crane

Numerous cracks were discovered in the initially installed polar crane rail.** Subsequent evaluations of the condition, resulted in a decision to replace the entire rail. A replacement rail was obtained and approximately 95% of the rail has been replaced. The new rail was attached by employing clips, which were welded to the base plate but not the rail. Discussions with cognizant personnel, did not indicate to the inspector that the overall construction progress was delayed as a result of the polar crane rail problem.

*CO Report No. 247/68-3, Paragraph II.D.2.

**CO Report No. 247/68-3, Paragraph II.E.

F. Mechanical Systems Field Fabrication

A preliminary review of the mechanical systems field fabrication records indicated that all materials and equipment received at the site are inspected by UE&C for visible damage and compliance with special shipping instructions. Special handling and storage requirements for Westinghouse procured items are noted on the UE&C receiving inspection report over the signature of a Westinghouse Quality Assurance representative. One receiving inspection report included a notation of the presence of surface fissures on a section of stainless steel safety injection system piping, procured from the Dravo Corporation. Records relative to this condition included the following information: SI-108-6", schedule 160, 304 stainless steel seamless pipe, design pressure - 2510 psig at 680° F, fissures noticed, dye penetrant indications ground out, and re-dye penetrant testing indicated fissures continuing to excessive depths. To date, no additional defective stainless steel piping, produced by Dravo, has been detected; however, UE&C has encountered faulty welds in several sections of carbon steel piping, produced by Dravo. The inspectors also determined that Dravo had not submitted mill reports and only a portion of the isometrics to the job site for the safety injection piping which has been shipped to date. UE&C, Westinghouse, and UST are aware of the problems and UE&C Quality Control is recommending that a resident inspector be sent to the Dravo plant to perform surveillance and inspection prior to shipment of the pipe.

The welding procedures for the safety injection system were reviewed with the UE&C welding foreman. Pertinent information relative to this subject is as follows:

1. Argon is used to purge the lines and provide an inert atmosphere during the welding of the root pass, which is made by the TIG process using 308 wire filler material.
2. All root passes under 0.25" are visually inspected and all root passes greater than 0.25" are dye penetrant checked.

3. Welds are completed with a shield-arc technique using E-308 electrodes with a lime coating.
4. Preheating temperatures are measured using a temple stick.
5. Unbroken packages of electrodes are stored in a room with an ambient temperature of about 80° F. When packages are opened, the electrodes are placed in a holding oven with a temperature of about 250° F. Welders remove only enough electrodes for approximately two hours work. At the end of the day, unused electrodes are returned to the oven. If necessary, the electrodes are baked out in accordance with the manufacturer's specifications.

The radiographic testing is subcontracted to an independent firm, which makes the initial film interpretation. The film is then reviewed by UE&C and Westinghouse. A report of the findings is signed by all three parties and the film is punched by a Westinghouse representative. UST audits these procedures and spot checks the film and report records for Con Ed.

The welding procedures for the safety injection system and the depth of radiographic interpretation of the films appear to be adequate. The problems associated with the Dravo piping will be followed during future inspections.

G. Storage

An inspection of component storage areas revealed two storage buildings which have temperature and some humidity control. These buildings are utilized for the storage of many critical components including instrumentation, electrical gear, pumps, and valves. The inspector believes that these building storage facilities are adequate. Many of the larger items such as primary pump casings, steam generators, a primary pump motor, recirculation pump motors, pressurizer relief tank, and miscellaneous piping are stored on pallets and rely on tarps or plastic coverings for weather protection. The inspector believes this type of

storage to be only marginally acceptable. Two areas of concern which were relayed to Con Ed for consideration were:

1. The temporary closure of two steam generators had been removed and tarps were being employed for closure. The inspector expressed concern relative to potential introduction of contaminants to the interior of the steam generator.
2. The primary pump casings have been directly subjected to adverse weather conditions as evidenced by the deteriorated paper which the casings are sitting on. The inspector indicated a concern relative to contaminants and their potential effects.

Con Ed, Westinghouse, and UE&C are aware of the storage problem, especially in view of the slip in the construction schedule and receipt of components for IP-3 and are pursuing measures which could correct the existing deficiencies.

H. Reactor Vessel

The reactor vessel has been moved inside the containment building and is scheduled for final installation during the early weeks of October, 1968. Visual observations by the inspector revealed no evidence of physical damage to the vessel during shipment.

I. Steam Generators

The steam generators have been in storage at the site since the last inspection.* The temporary closures have been removed from two of the steam generators in preparation for movement to the containment building for final installation. The open ends of the steam generators are protected from the weather by tarps. The inspector indicated reservations concerning this method of closure and raised questions relative to introduction of contaminants to the vessel. This item will be followed during future visits.

*CO Report No. 247/68-3, Paragraph II.I.

J. Training

Fourteen IP-1 licensed senior reactor operators have been assigned to IP-2 for training. Prestele indicated that they will spend the majority of the time in conjunction with IP-2 but will spend a sufficient time at IP-1 to keep themselves abreast with operational characteristics of the plant. These individuals previously attended a six-week extensive reactor training session conducted by Westinghouse.

K. Preoperational Testing and Operating Procedures

Writing of Preoperational Testing and Operating Procedures have been initiated by Con Ed. Mr. Prestele indicated a present lack of Westinghouse system descriptions but felt that satisfactory procedures would be available.

L. Electrical Cables

A review of the design criteria for electrical cable sizing and cable tray loading with Westinghouse and Con Ed revealed the following:

1. Cable size selection is made on the basis of National Electric Code (NEC) and using 125% of maximum anticipated loads.
2. Cables are then derated on the basis of Insulated Power Cable Engineers Association (IPCEA) for cable and conduit loadings.
3. Power cables are separated from control cables.
4. Individual redundant instruments control channels are placed in separate trays or are separated by a thermal barrier.
5. Thermal barriers will be installed in each vertical cable tray.

6. Short circuit protection is provided for all control and power cabling.
7. The cable design has not been completed for the pressurizer heaters. The above listed criteria will be met or exceeded. Westinghouse is considering performance of thermal tests on the selected cables.

III. Indian Point No. 3 (IP-3)

A tour of the IP-3 construction site revealed the following:

- A. Production blasting and major earth removal has been completed.
- B. The containment building ground leveling mat has been poured. Erection of the reinforcement bars for the containment building base mat is in progress.
- C. The ground leveling mat for the turbine building was being poured at the time of the visit.
- D. The intake coffer dam is basically complete.
- E. Erection of construction office buildings is in progress.

IV. Management Interview

Separate management exit interviews were held with Messrs. Prestele and Corcoran at the conclusion of the visit. The following items were included in the discussions:

A. Containment Liner

The containment liner dimensional measurement program was reviewed. The inspector indicated that the dimensional measurements appeared acceptable to the 190 foot elevation. Upon inquiry, Mr. Corcoran indicated the measurements of the dome area would be completed prior to placement of the dome concrete.

B. Cadweld Splicing

The inspector indicated satisfactory findings with respect to the Cadweld splicing of reinforcement bars.

C. Concrete

The batch plant problems were reviewed. The inspector indicated acceptable resolution of the May 8, 1968 mix problem related to the use of crushed stone aggregate as a substitute. Mr. Corcoran indicated that no additional batch plant deficiencies have been noted since the last inspection.

D. Mechanical System Field Fabrication

The quality problems associated with piping procured from Dravo was discussed. Mr. Corcoran indicated his knowledge of the problem and intent to follow this to a satisfactory conclusion.

The inspector indicated that a preliminary review of welding and radiographic procedures indicated adequate coverage.

E. Storage

The component storage was reviewed. The inspector related specific concerns relative to the storage of the primary pump casings and temporary closures of the steam generators. Mr. Corcoran indicated that the shortcomings of component storage is presently being reviewed. The inspector indicated that this matter would be pursued further during future visits.

F. Schedule

The slippage in the construction schedule was discussed. Mr. Corcoran stated that present information indicates that the initial fuel loading will take place about January, 1970.

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