

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

Report of Inspection

CO Report No. 247/70-11

Licensee: Consolidated Edison Company
Indian Point No. 2 (IP-2)
License No. CPPR-21
Category B

Dates of Inspection: November 4, 5, 24, 25, 1970

Dates of Previous Inspections: October 7, 8, 13 and 14, 1970

Inspected By: G. L. Madsen 12/30/70
G. L. Madsen, Reactor Inspector Date

Reviewed By: N. C. Moseley 12/30/70
N. C. Moseley, Senior Reactor Inspector Date

Proprietary Information: None

SCOPE

Announced inspections were made to the Indian Point No. 2 (IP-2) construction site on November 4, 5, 24 and 25, 1970. Major items discussed included preoperational testing, mechanical system cleanup, closure of containment, pipe hanger and support installation, electrical installation surveillance, and resolution of outstanding items.

SUMMARY

Sixty percent of the Phase II system functional test procedures have been approved for use by Con Ed and Wedco. The accumulator check valve leakage test does not conform to the FSAR requirements. Several systems are basically ready for Phase II testing. (Section II. A. 1, 2 and 3)

The proposed compliance meeting with Con Ed and Westinghouse relating to pre-operational testing, core loading, and power ascension program philosophies was presented. (Section II. A. 4)

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Some differences exist within Con Ed and Wedco with relation to needed participation of operators in the performance of preoperational testing. (Section II. A. 5)

As a result of previous findings, Wedco and Con Ed are performing a final inspection of mechanical systems just prior to installing insulation. This approach should minimize the potential for arc strikes and weld splattering following final acceptance. (Section II. B.)

UE&C design engineering recommended the removal of exterior concrete to permit evaluation of a rebar coverage question. (Section II. C.)

Con Ed is presently compiling listings of pipe supports within containment, are determining status of installation, and will perform inspections relative to correct positioning clearance, and quality of workmanship. (Section II. D.)

Con Ed has completed their electrical cable installation review. Data indicates that some 80 percent of the protection and safeguards cabling was checked. Future audits are to be performed on fire and separation barriers. The question relating to control of electrical cable installation is considered to be resolved. (Section II. E.)

A copy of the operating and abnormal occurrence procedures were made available for review. (Section II. F.)

A scoping of existing logs within Con Ed construction and Wedco quality control was made. (Section II. G.)

The present target dates for starting the hot functional testing and core loading are December 13, 1970 and February 10, 1971, respectively. (Section II. A.)

The resolution of six previously identified items is included. (Section II. J.)

A listing of items requiring resolution and followup is included in this report. (Section II. K.)

DETAILS

I. PERSONS CONTACTED

Con Ed

Mr. A. Corcoran, Construction Project Superintendent
Mr. E. Dadson, Quality Assurance Supervisor
Mr. R. Cosgrove, Mechanical Engineer, Startup
Mr. A. Kohler, Nuclear Engineer, Construction Department
Mr. O. Buesse, Electrical Inspector, Startup
Mr. T. Houlihan, Electrical Inspector
Mr. D. McCormack, General Superintendent - IP-1

Wedco

Mr. M. Snow, Manager, Reliability
Mr. W. Dibeler, Manager, Site Quality Control

II. RESULTS OF INSPECTION

A. Preoperational Testing

1. Status of Procedure Preparation

Sixty percent of the Phase II system preoperational procedures have been approved by Con Ed and Wedco. An additional 30 percent is in the final review status.

2. Review of System Functional Test Procedures

The following listed systems test procedures were reviewed to varying depths by the inspector:

<u>Procedure No.</u>	<u>Title</u>
4.1.9	Pressurizer Spray Flow Verification
4.2.3	Pressurizer Level Control Test
4.2.4	Boron Recycle Process
4.2.5	Demineralizer Bed Conditioning
4.5.2	SIS Accumulator Check Valve Leakage
4.6.1	Liquid Waste Receiving and Storage
4.6.2	Liquid Waste Processing
4.6.3	Gaseous Waste Disposal
4.10.4	Part Length Rod Brake Test
4.11.1	In Core Thermocouples
4.11.2	Moveable Detectors
4.18.1	Feedwater Treatment
4.22.2	Lube Oil System
4.24.1	Secondary Sampling
4.29.2	Extraction Steam
4.40	Condenser Air Removal

Procedure 4.5.2 does not specify checking accumulator check valve leakage at a delta pressure of 100 psi as described in the FSAR*.

3. Status of Test Performance

Flushing and hydrostatic testing in preparation for the Hot Functional Testing is nearing completion. The Phase II system functional testing has been limited to systems such as service air, instrument air, service water, and circulating water. Mr. Cosgrove indicated that the component cooling, safety injection, waste disposal, chemical volume control, and reactor coolant systems are basically ready for Phase II testing.

4. Proposed Compliance Meeting with Con Ed and Westinghouse

As per telephone request from J. P. O'Reilly, Con Ed was informed of a Compliance desire for a meeting with Con Ed and Westinghouse personnel for the purpose of discussing philosophies relating to preoperation testing, core loading, and power ascension programs. The inspector pointed out that hopefully the meeting would result in all parties having a better understanding relative to the Compliance program and would minimize differences which require resolutions for future plants. Con Ed indicated that they and Wedco were receptive to the request. In preparation for the meeting the inspector requested and received specific procedures which were subsequently forwarded to CO:HQ for review. Upon request, the inspector indicated that possible subjects for discussion during the meeting could be:

- a. Administrative control of procedure preparation and review of results.
- b. Control rod drop test requirements.
- c. Safety injection functional testing.
- d. Loss of normal plant AC power during the power ascension program.
- e. Specific problems observed during startup of similar facilities.

The inspector stated that requested material would be forwarded to CO:HQ for consideration and incorporation into the meeting and that a meeting date was dependent on the CO:HQ preparation time.

5. Operator Involvement

The inspector asked Con Ed and Wedco personnel for an explanation relating to degree of involvement of Con Ed production operators during the performance of preoperational testing. Most specifically, the inspector was interested in the involvement of the prospective AEC licensed operators. An apparent difference of opinion evolved with respect to needed participation. The inspector indicated that an extensive involvement and familiarization seems prudent. Con Ed and Wedco agreed that this was an area which needed additional definition and understanding.

B. Mechanical System Cleanup

As previously reported, a field review of a portion of the safety injection system revealed the presence of arc strikes and fit-up attachment welds on areas which had been subjected to a mechanical cleanup program*. Wedco and Con Ed are presently performing a final inspection just prior to attachment of insulation to the system components. This approach should minimize the potential for arc strikes and weld splatter following final release. The inspector indicated that a spot audit of this activity would be performed during a future inspection.

C. Containment

1. Concrete

During the last inspection, some rebar, that was protruding from previously placed concrete, was noted to be close to the exterior surface**. The inspector was informed that the UE&C design engineer evaluated the condition and recommended removal of some concrete to verify adequate coverage. This item will require additional Compliance followup.

2. Cadwelds

As requested by CO:HQ, the following data relating to cadweld testing for the Containment Building was obtained:

- a. Total cadwelds formed was 22,444.

*CO Report No. 247/70-10, paragraph II. B.

**CO Report No. 247/70-10, paragraph II. C.

- b. Representative test information relating to 18,075 cadwelds formed indicates that 511 production cadwelds were removed for strength testing. Of the 511 cadwelds which were subjected to the strength test, 11 failed below 125 percent of the yield strength for the reinforcement bar.
- c. Similar test data for the remaining 4369 cadwelds formed was available; however, the data was not in tabular form.

D. Pipe Supports

The pipe support and restraint control program of Wedco construction and quality control was previously reported*. Con Ed is compiling a listing of all pipe supports within the containment building. Mr. Corcoran stated that they are presently determining the status of installation for each support and will perform constant inspections to determine correct positioning, clearance and quality of workmanship for each support.

E. Electrical

1. Electrical Cable Installation

Placement and termination of electrical cabling is 95 percent complete. Wedco and Con Ed have completed their surveillance programs relating to cable installation conformance to cable pulling schedules. Con Ed has compiled data which indicates that some 80 percent of the protection and safeguards cabling has been checked. Con Ed indicated that discrepancies noted during the installation surveillance and the present disposition of each item is as follows:

- a. Safety injection pump motors - Crossover of cables between conduits and electrical trays. Barriers have been installed.
- b. Residual heat removal pump cables contained in a common junction box. Separators have been installed.
- c. Recirculating system pump cables contained in a common junction box. Separators installed.
sidered.
- d. Diesel buses not completely insulated in accordance with the FSAR. Resolution of item being considered.

*CO Report No. 247/70-9, paragraph II. D. 2 and 247/70-10, paragraph II. D. 2.

- e. Parts of trays omitted. Generally found at the end of cable trays. Trays are being extended.
- f. Crossover of redundant channel cables at penetration H 48 and H 49. Barriers to be installed.
- g. Some labeling of trays missing.
- h. Fire barriers not installed. Scheduled to be accomplished at a later date.
- i. Crossover of diesel generator control cables at entrance to tunnel. Separator box installed.

Con Ed indicated that based on findings to date, their cable surveillance program is complete, with the exception of a final audit of fire and separations barriers.

Based on the combined efforts of Westinghouse and Con Ed, the inspector considers the previous question* relating to the lack of control of electrical cable installation to be resolved.

F. Operating Procedures

A copy of the facility operating and abnormal occurrence procedures was made available to the inspector for review.

G. Log Books

The inspector made a scoping of existing log books within Con Ed construction and Wedco quality control. Observations included the following:

1. Con Ed Construction

Individual inspectors are issued books which are used for recording the individual's observation or specific questions. The quality oriented items are referred to the quality control supervisor and are resolved or placed on a punch list. The inspector made a spot audit of one book and indicated that the resolution of many questions could not be ascertained from the book or punch list. Mr. Dadson stated that Con Ed would perform additional reviews and provide further clarification which would include upgrading the mechanical punch list.

*CO Report No. 247/69-12, Appendix A

Additional log books are employed for recording job assignments and progress of work; however, these are not quality oriented.

2. Wedco, Quality Control

The Wedco Quality Control inspectors have daily note books for recording on the spot work performance status, progress, and observation to be included in the permanent records. Wedco indicated that note books relating to job assignment are also employed. Mr. Snow indicated that the above note books are available for review by the inspectors.

H. Scheduling

Phase II system functional preoperational testing is in progress. The present target dates for starting the hot functional testing and core loading are December 13, 1970 and February 10, 1971, respectively.

I. Fuel Storage Building

As previously reported*, several items required action for completion of the Fuel Storage Building. Discussion with Con Ed personnel revealed that the following actions have been completed.

1. Replacement of flow indicator FI-603.
2. Lighting connected to permanent power supply.
3. P. A. System removed from temporary connection to IP-1 and completed inter-tie with IP-2.
4. Completed installation and operational tests of pit temperature and level instruments.
5. Completed installation of heating system.

Items 1, 2, 4, 5, 6, and 11* require additional followup.

*CO Report No. 247/69-9, Appendix A.

J. Resolution of Previously Identified Items (CO Reference in Parenthesis)

1. Emergency diesel control cables not properly separated. (247/70-1, Appendix A). Corrective actions have been completed.
2. Diesel automatic under-voltage start initiation has been transferred to the 480 volt buses. (DRL Report to ACRS dated July 2, 1970)
3. Lack of control on electrical cable installation (247/70-1, Appendix A). Resolution included in Section II. E. 1. of this report.
4. The installation of redundant electrical tunnel fans has been completed. (DRL report to ACRS dated July 2, 1970).
5. Charcoal filters for the refueling building. (DRL Report to ACRS, September 4, 1970). As indicated in an ACRS letter*, the installation of these filters are to be installed prior to completion of the first year of full power operation.
6. Opening of the accumulator motor operated valves with actuation of a SIS signal. (DRL Report to ACRS dated September 4, 1970). This test is included in preoperational test procedure No. 4.26.3.

K. Items Requiring Followup

Resolution is required for the following items (CO Report reference in parenthesis):

1. SIS Valves-CF8 vs. CF8M (247/69-11, Section II. B. 3.)
2. Reactor Pressure Boundary - Table A (247/69-11, Section II. C.)
3. Fuel Storage Building - completion of preops - (247/69-9, Section II. G.)
4. Pipe Supports - Stainless Shims (247/69-9, Section II. J.)
5. Code "N" Stamp on Section III, Class "C" Vessels (247/69-7, Section II. N.)

*ACRS letter to Mr. Seaborg, dated September 23, 1970.

6. Lateness of Preoperational Procedure Preparation (247/70-2, Section II. B.)
7. Pressurizer - Base Plate Question (247/70-8, Section II. K.)
8. Containment Penetration Bellows (247/70-6, Section II. F.)
9. Electrical Barriers Installed (247/70-5, Section II. B.)
10. Cable Tray Loading Audit (247/70-5, Section II. B.)
11. Pipe Support Installation and Clearance Review (247/70-6, Section II. C.)
12. Circulating Water Pump Bearing Sleeve Modification (247/70-8, Section II. F.)
13. In-depth Quality Control Followup Items (247/70-1, Appendix A):
 - a. Pressurizer surge nozzles not UT.
 - b. SIS - evidence of lack of first line quality control.
 - c. 480 switchgear - air lines and air compressor.
 - d. SIS boron tank valve modification.
 - e. Single electrical penetration.
14. DRL Report to ACRS, dated July 2, 1970
 - a. Tunnel fire protection installed.
 - b. Installation of strong motion seismograph.
 - c. Internals vibrational preoperational test coverage.
 - d. Demonstration of hydrogen recombiner throttle back - pre-operational test.
 - e. Alarm arrangement on protection channels.
 - f. Installation of hydrogen recombiner.

15. DRL requests:
 - a. Possibility of defeating manual trip with reset buttons.
 - b. Trip breaker annunciation and bypass interlocks.
16. FSAR, Volume V
 - a. Remote control and instrumentation outside of control room.
 - b. Installation of modern fuel failure detection instrumentation.
17. DRL Report to ACRS, dated September 4, 1970
 - a. Seismic reinforcement of buildings.
 - b. Additional turbine overspeed protection.
 - cc X-y stability test - power ascension.
 - d. Iodine filters installed - recirculation fans - preceded by HEPA filters.

III. Management Interview

Management interviews were conducted with Messrs. Corcoran, Dadson and Kohler at the completion of the site inspections on November 5 and 25, 1970. Items discussed included:

A. Preoperational Testing

The inspector stated that the accumulator check valve leakage test procedure No. 4.5.2 does not specify performance to the FSAR requirements. Mr. Kohler agreed to followup on this item. The proposed Compliance, Westinghouse and Con Ed meeting was reviewed. The inspector indicated that the meeting date would be proposed in the near future. The inspector indicated a concern relative to the absence of a program for involvement of operators. Mr. Corcoran indicated that this item would receive additional consideration.

B. Mechanical System Cleanup

The present Wedco and Con Ed final inspection program for cleanup of mechanical systems was reviewed. Mr. Dadson indicated that constant surveillance of this activity is being performed by Con Ed personnel. The inspector indicated that a spot audit of this activity would be performed during a future inspection.

C. Containment

The inspector indicated a need to review the UE&C evaluation relating to the acceptability of the rebar condition of the equipment hatch opening. Mr. Corcoran indicated that additional information will be forthcoming; however, in the interim, work will progress.

D. Pipe Supports

The Con Ed and Wedco control programs for pipe supports were reviewed. The inspector indicated satisfactory findings relating to the outlined program. The inspector also indicated that Compliance is contemplating a design analysis review relating to pipe supports and restraints.

E. Electrical

The status of the electrical installation surveillance was discussed. Mr. Corcoran indicated that based on the findings to date their surveillance program has been completed. The inspector indicated that the combined efforts of Con Ed and Westinghouse on this item provides sufficient data for considering the previous question relating to lack of electrical separation to be resolved.

F. Log Books

The finding relating to existing Con Ed construction and Wedco Quality Control log books was discussed. The inspector indicated that Compliance may desire to review the context of available log books in the near future.

G. Resolution of Items

The inspector indicated that the items included in Section J of this report are considered to be satisfactorily resolved.

H. Recent Experiences at Facilities Similar to IP-2

The inspector indicated that the Rochester Gas and Electric plant had encountered problems with the reactor coolant pump bolts and moisture separators. Mr. Corcoran indicated that Con Ed was aware of these problems and followup is in progress.

The inspector indicated the Wisconsin Michigan Power Company plant at Point Beach encountered a stuck rod during testing. Mr. Corcoran indicated that Con Ed would investigate this item with the intent of eliminating a similar occurrence at IP-2. The inspector indicated that the basic cause of the stuck rod was the presence of metal chips in the rod guide assembly.