

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

Report of Inspection

CO Report No. 247/70-9

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

Dates of Inspections: September 8, 23 and 25, 1970

Dates of Previous Inspections: July 30, 1970 and August 4, 5, 19,  
24, and 25, 1970

Inspected By: *N. C. Moseley* 10/31/70  
G. L. Madsen, Reactor Inspector Date

Reviewed By: *N. C. Moseley* 10/31/70  
N. C. Moseley, Senior Reactor Inspector Date

Proprietary Information: None

SCOPE

Announced inspections were made of the Indian Point No. 2 (IP-2) construction site on September 8, 23, and 25, 1970. Major items discussed included pre-operational testing, mechanical systems cleanup, electrical review, closure of containment, and evaluation of the pressurizer question. Mr. R. Brown accompanied the inspector on September 8, 1970 to assist in the evaluation of the site UT of the pressurizer.

SUMMARY

Forty seven percent of the Phase II system preoperational tests have been approved for use. An additional 28 percent have been issued by Wedco for review by Con Ed. A review of the preoperational procedure outline versus the requirements of the FSAR revealed a need for an additional twelve tests. A hot functional test program has been prepared. The safety injection system is scheduled to be functionally checked with the reactor coolant system in the cold condition and the reactor vessel head removed. (Section II. A.)

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The mechanical system cleanup program is 95 percent complete. Re-audits of the program will be performed once Wedco and Con Ed indicates a 100 percent acceptance of systems. (Section II. B.)

Nine conditions were identified where the nominal diameter of the containment liner exceeds the tolerance limit of the FSAR. The condition has received an engineering evaluation. The condition was deemed to be acceptable and an amendment to the FSAR will be forthcoming. (Section II. C. 1.)

The containment pipe bellows material and weldments continues to be an unresolved item. (Section II. C. 2.)

Survey data for the personnel and equipment access openings to the containment building was made available. UE&C, Westinghouse, and Con Ed concur that placement of reinforcement bars and cadwelds is acceptable and have approved placement of concrete for these areas. Placement of concrete for these areas and the north construction access is in progress. Previous concerns relating to the closure of containment are considered to be resolved. (Section II. C. 3.)

Installation of some protective stainless steel bands, between carbon steel supports and stainless pipe is to be provided. The extent of this action is to be defined by October 14, 1970. (Section II. D. 1.)

The pipe support installation is in progress. Wedco quality control indicated that a 100 percent audit of seismic restraints was planned, and a quality audit program for some 4100 other pipe supports would be given consideration. (Section II. D. 2.)

Additional UT of the pressurizer has been performed for the purpose of determining the acceptability of the base plate material. A meeting is scheduled for October 7, 1970 on this subject. (Section II. E.)

The present scheduled core loading date is January, 1971. (Section II. F.)

Mr. W. Dibeler has replaced Mr. T. Lawson as the Wedco Manager of Site Quality Control. (Section II. G.)

Three previously identified items have been resolved. (Section II. H.)

A listing of items requiring resolution and/or followup is included in this report. Six items were added as a result of the September 4, 1970 DRL report to ACRS. (Section II. I.)

DETAILS

I. Persons Contacted

Con Ed

Mr. F. McElwie, Resident Construction Manager  
Mr. A. Corcoran, Construction Project Superintendent  
Mr. E. Dadson, Quality Assurance Supervisor  
Mr. R. Cosgrove, Mechanical Engineer, Startup  
Mr. A. Kohler, Nuclear Engineer, Construction Startup  
Mr. R. Schuster, Quality Control Inspector

Wedco

Mr. M. Snow, Manager, Reliability  
Mr. W. Dibeler, Manager, Site Quality Control  
Mr. D. Walcott, Mechanical Construction Manager  
Mr. W. Stemmermand, Piping Superintendent

II. Results of Inspection

A. Preoperational Testing

1. Status of Procedure Preparations

Forty-seven percent of the Phase II system preoperational test procedures have been approved for use by Wedco and Con Ed. An additional 28 percent have been issued by Wedco for review by Con Ed.

As reported previously, a review of the context of the preoperational procedure outline versus FSAR requirements was in progress\*. Twelve Phase II preoperational tests have been added to the previous outline as a result of this review. Con Ed personnel indicated that additional procedures will be required for the reactor coolant leak detection instrumentation and the hydrogen recombiner.

2. Status of Test Performance

About 80 percent of the Phase I flushing and hydrostatic testing has been performed. The Phase II functional testing has been limited to the instrument air, service air, service water and circulating water systems.

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\*CO Report No. 247/70-8, paragraph II. A. 3. c.

3. Review of System Functional Test Procedures

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

<u>Procedure No.</u>	<u>Title</u>
4.1.5	RCS Leakage Test
4.1.10	Pressurizer Power Relief Valves
4.1.12	RCS Vibrational Test
4.2.4	Boron Recycle Process
4.4.1	Sampling System Functional
4.16.2	Functional Test Service Air
4.22	Lube Oil Systems
4.31	Turbine Generator
4.43	Water Chemistry

The following concerns emerged from the above review:

- a. Procedure 4.1.5 outlines a volumetric leakage check of the reactor coolant system; however, a moisture detection instrumentation checkout is not included as required by the FSAR\*. Mr. Kohler acknowledges that the testing requirement exists and will be performed in conjunction with the hot functional testing.
- b. Procedure 4.1.12 covers vibrational checking of the reactor coolant system and includes acceptance values for the reactor coolant pumps; however, vibrational acceptance values for other components are not included.

Mr. Kohler stated that he would pursue this matter and provide the inspector with an answer.

- c. Procedure 4.43 outlines a general water chemistry readiness program which Westinghouse representatives are to cover with cognizant Con Ed personnel. The procedure does not present a specific listing of items required to assure optimum plant chemistry readiness.

Mr. Kohler indicated that he had similar feelings and the item is presently being discussed with Wedco.

Previous reviews of system functional preoperational procedures revealed concerns\*\*. The present status of these items is as follows:

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\*Volume V, Q. 4.4.4.

\*\*CO Report No. 247/70-8, paragraph II. A. 3.

- a. Several procedures indicated that additional testing would be performed during the hot functional program; however, the proposed outline did not include a specified hot functional program. Con Ed presented the inspector with a documented hot functional program. This program includes references to portions of other procedures which will be completed during the hot functional testing program and the previous concerns are considered to be resolved.
- b. Some procedures did not include anticipated values. The inspector was informed that this concern will be kept in mind during the future review of procedures and significant acceptance values would be available for all previously reviewed procedures.

4. Hot Functional Test Program

A documented hot functional program was presented to the inspector. The program includes the following:

- a. Description of system which must be available, flushed and hydrostatically tested prior to hot functional testing.
- b. An outline of the total functional preoperational testing which must be completed prior to reactor coolant heatup.
- c. An outline of specific portions of the total preoperational testing which is to be performed during the hot functional testing.
- d. Performance testing required prior to core loading.
- e. Performance testing to be completed after core loading and prior to initial criticality.

The Safety Injection System (SIS) functional test is scheduled to be performed following reactor coolant system cooldown and removal of the reactor vessel head. Procedure 4.5.1 for this system has not been made available to the inspector; however, based on the proposed hot functional program outline, the SIS system will be checked out with the reactor coolant system in the cold condition and the reactor vessel head removed. This item will receive specific attention during the planned review of the SIS Functional Test Procedure No. 4.5.1.

B. Mechanical Systems Cleanup

Wedco stated that the mechanical system cleanup program is 95 percent complete. The inspector inquired as to which systems were 100 percent complete and was informed that some small amount of work remains to be performed on most systems. The inspector indicated that a re-audit of this program will be performed once Wedco and Con Ed indicates 100 percent acceptance of systems.

C. Containment

1. Containment Liner

As previously reported, nine conditions exist where the nominal diameter of the liner exceeds the two-inch tolerance limit of the FSAR\*. A deviation report was prepared by Wedco and forwarded to UE&C for a design evaluation. The UE&C design engineers concluded that the existing condition is acceptable. Con Ed agrees with this position and indicated that a change to the FSAR would be forthcoming.

2. Pipe Penetrations

As previously reported, questions have been raised with regard to weldment quality and material compatibility at pipe penetration expansion bellows for the containment building\*\*. Con Ed indicated that investigation on this subject has not been completed.

3. Containment Closure

Closure of the three construction access openings for the containment building continues. As previously reported, survey data of reinforcement bar and cadweld placement for the north access opening was evaluated by CO:HQ. The only real concern appeared to be a potential insufficient concrete coverage for some exterior cadwelds\*\*\*. The UE&C design engineers evaluated the data and concluded that the existing condition is acceptable and recommended that concrete forms be placed to assure a minimum of three-inch concrete coverage for the bars. Westinghouse and Con Ed concurred and concrete placement has been completed for the north opening.

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\*CO Report No. 247/70-8, paragraph II. E. 2.

\*\*CO Report No. 247/70-8, paragraph II. E. 1.

\*\*\*CO Report No. 247/70-8, paragraph II. E. 3.

Reinforcement bar and cadweld placement surveys for the personnel and equipment hatch areas were made available to the inspector. Review of the surveys and accompanying correspondence indicated to the inspector that the UE&C design engineers had evaluated the existing conditions and UE&C, Westinghouse and Con Ed have approved placement of concrete for these two remaining areas. A field review of concrete form placement, by the inspector, revealed:

- a. A minimum of 2 1/2 inches between cadwelds and the concrete forms.
- b. Adequate spacing between reinforcement bars.
- c. Evidence of an active cleanup program prior to concrete placement.

Discussion relating to the concrete placement for the three access openings revealed that

- a. UST is providing surveillance for Con Ed. The inspector asked to see reports on this surveillance and was informed that reports have not been received; however, no discrepancies were reported for the placement in the north access opening.
- b. Three design mixes have been approved. Aggregate size is being limited to 3/8 inch.

As a result of the above observations, the previous concerns relating to the closure of containment are considered resolved\*.

D. Pipe Supports

1. Protective Bands

As previously reported, UE&C recommended that carbon supports should be firmly anchored to stainless steel pipes, or a 20 gauge stainless protective band should be provided between the pipe and the support\*\*. Westinghouse has indicated that the installation of protective bands should be limited to systems where normal operating temperatures exceed 300°F. The licensee stated that Westinghouse has promised to have the scope of the protective band installation defined by October 14, 1970.

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\*CO Report No. 247/69-11, paragraph II. E.

\*\*CO Report No. 247/70-8, paragraph II. I.

2. Installation Control Program

The pipe support design for hangers and restraint was performed by Bergen Paterson Corporation (BP) on a contract from UE&C. Approved drawings for all systems are available at the site. The site installation control program includes the following:

- a. J. Courter Company has the installation contract with Wedco.
- b. Wedco Construction monitors the installation on a daily basis and identifies conditions where supports cannot be installed as scheduled. These conditions include lack of clearance and questionable design conditions. Deviation reports are prepared and forwarded to UE&C for a design evaluation.
- c. UE&C and BP jointly review each condition included in the deviation reports and specify corrective actions. Design changes also receive a review by Con Ed Engineering.
- d. Wedco Construction personnel indicated that a record is being maintained for the 4100 hangers and 690 seismic restraints and that the records will indicate installation to original design or will contain a disposition of all required deviations.
- e. Wedco, Quality Control, indicated that a 100 percent audit of the seismic restraints was planned. The inspector asked if any review of the 4100 hangers was anticipated. Mr. Snow indicated that this was not in the present plan; however, a quality audit program would be given consideration.
- f. Con Ed Site Quality Control personnel plan to perform audits of the support installation to assure as designed installation.

E. Pressurizer

During pre-service UT inspections of the pressurizer welds, a question relating to the base material emerged\*. Subsequent UT of the area in question was performed. The results of this review were previously reported\*\*. Con Ed is presently awaiting evaluation reports from Westinghouse, Southwest Research and United States Testing. In addition, the vendor fabrication radiographs are to be made available for review. Con Ed has arranged a meeting for October 7, 1970 for the purpose of radiographic review and presentations relating to the acceptability of the pressurizer base plate material.

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\*CO Report No. 247/70-8, paragraph II. J.

\*\*Inquiry Memorandum No. 247/70-A.

F. Schedule

The scheduled core loading date has been changed from November 23, 1970 to January, 1971. Hot functional testing is scheduled to begin in December, 1970.

G. Organization

Mr. T. Lawson, the former Wedco Manager of Site Quality Control, has been replaced by Mr. W. Dibeler. The inspector reviewed Mr. Dibeler's resume of job experience and no appreciable loss of coverage is anticipated as a result of this organization change.

H. Resolution of Previously Identified Items (CO Report reference in parenthesis)

1. Closure of Containment (247/69-9, Section II. J.) The resolution is included in Section II. C. 2. of this report.
2. Diesels in Common Room. A reinforced concrete wall has been erected between the diesel generators and the control panel, as required by the FSAR\*.
3. LOCA analysis question, as reported in the July 2, 1970 DRL report to ACRS is considered resolved by the context of the September 4, 1970 DRL report to ACRS.

I. 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 - FSAR discrepancies (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.)
6. Lateness of Preoperational Procedure Preparation (247/70-2, Section II. B.)

7. Replacement of Main Steam Flow Nozzles (247/70-4, Section II. I.)
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. Pressurizer - Base Plate Question (247/70-8, Section II. K.)
14. 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. Need for independent cable design review.
  - d. Lack of control on electrical cable installation.
  - e. Emergency diesel control cables lack separation.
  - f. SIS boron tank valve modification.
  - g. Single electrical penetration.
  - h. 480 switchgear - air lines and air compressor.
15. DRL Report to ACRS, dated July 2, 1970
  - a. Tunnel fire protection installed.
  - b. IP-1 stack - removal of 80 feet.
  - c. Installation of strong motion seismograph.
  - d. Diesel auto start from 480 volt buses.
  - e. Internals vibrational preoperational test coverage.
  - f. Demonstration of hydrogen recombiner throttle back - pre-operational test.

- g. Alarm arrangement on protection channels.
  - h. Installation of hydrogen recombiner.
  - i. Installation of redundant electrical tunnel fans.
16. DRL Requests:
- a. Possibility of defeating manual trip with reset buttons.
  - b. Trip breaker annunciation and bypass interlocks.
17. FSAR, Volume V
- a. Remote control and instrumentation outside of control room.
  - b. Installation of modern fuel failure detection instrumentation.
18. DRL Report to ACRS, dated September 4, 1970
- a. Seismic reinforcement of buildings.
  - b. Additional turbine overspeed protection.
  - c. X-y stability test - power ascension.
  - d. Motor operated accumulator valves open with SIS signal - Preop.
  - e. Charcoal filters installed for refueling building.
  - f. Iodine filters installed - recirculation fans - proceeded by HEPA filters.

### III. Management Interview

Management interviews were conducted with Messrs. Corcoran and Dadson. Items discussed included:

#### A. Preoperational Testing

The inspector related his continued concerns relative to lateness of preoperational test procedure preparation. Mr. Corcoran indicated that this effort continues to be ahead of construction. The inspector acknowledged the receipt of a hot functional program procedure and indicated

that an initial look at this procedure raises questions relative to the testing of the safety injection system which will be given additional consideration when Procedure No. 4.5.1 is made available for review.

B. Mechanical System Cleanup

The inspector indicated that a re-audit of the mechanical systems cleanup program will be performed once Con Ed indicates 100 percent acceptance of systems. Mr. Dadson indicated that this approach had been anticipated and that the inspector would be kept informed as individual systems are completed.

C. Containment

The status of the containment liner diameter question was reviewed. Mr. Dadson stated that a FSAR amendment on this item will be forthcoming. The inspector indicated that the previous concerns relating to the closure of containment is considered to be resolved; however, the pipe bellow item requires additional investigation. Mr. Dadson agreed that the evaluation of the bellows item is incomplete.

D. Pressurizer

The status of the pressurizer base plate question was reviewed. The inspector indicated that comments relative to the acceptability of this plate would be reserved until after the scheduled October 7, 1970 meeting.

E. Pipe Supports

The inspector stated a need for a better definition relating to locations where stainless steel protective bands are to be installed. Mr. Dadson stated that this would be available by October 14, 1970.

The inspector indicated a generally favorable impression relative to the pipe support installation control program; however, the planned Wedco Quality Control involvement may need some expansion. Mr. Dadson agreed to pursue this matter.

F. Resolution of Items

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