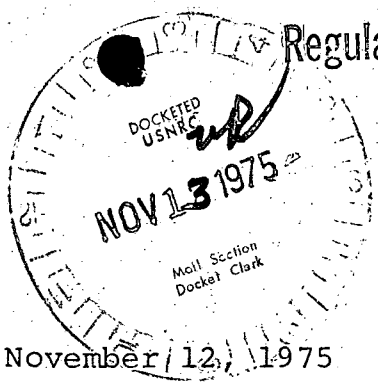
William J. Cahill, Jr.
Vice President

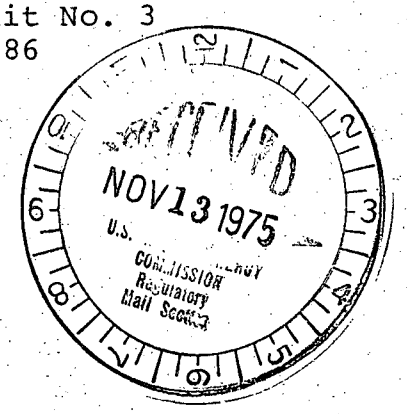
Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N Y 10003
Telephone (212) 460-3819

Regulatory Docket File



November 12, 1975

Re Indian Point Unit No. 3
Docket No. 50-286



Mr. R. C. DeYoung
Assistant Director for
Light Water Reactors, Group 1
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. DeYoung

Attached please find our response to all of the items in your November 5, 1975 letter except Items 4, 5c and 6. Our reply to those items will be forwarded to you shortly.

Very truly yours

William J. Cahill, Jr.
Vice President

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mk

Copy to John P. O'Reilly, Director
Office of Inspection and Enforcement
Region 1
U. S. Nuclear Regulatory Commission
King of Prussia, Penn. 19406

Sworn to before me this
12 day of November, 1975.

Notary Public

WALTER S. HOSMER
Notary Public State of New York
No. 30-6973150
Qualified in Nassau County
Certificate filed in New York County
Commission Expires March 30, 1976

13027

ENCLOSURE 1

A. Preoperational, Startup & Ascension to Power

A.1 Pre-Core Load Operational Tests

With the exception of the procedures identified below, all of the procedures in A.1 of Enclosure 1 of your November 5, 1975 letter will be completed and accepted prior to core load.

4.8.3 Time Response Test is 99% complete. Final acceptance pending completion of data review. Final acceptance will be completed prior to RCS heatup except for the portion requiring results from RCS flow coastdown test (INT-TF-4.1.3). This portion will be completed prior to inital criticality.

Basis - Reactor protection and automatic safeguards actuation are not required when in cold shutdown. The low flow trips are not required prior to initial criticality.

4.2.1 CVCS

Test is 35% complete. All testing required by FSAR has been completed. Additional operating parameters will be measured prior to initial criticality.

Basis - All FSAR required testing has been completed.

4.11.6 Fire Protection

The portion of the system identified as being required for core loading has been completely installed and tested. This testing includes the following:

a) All Deluge Valve Alarms

b) All Hose Reels

c) All Deluge Systems to Transformers, Electrical Tunnels, and all Oil Systems

d) All Foam Systems and Foam Nozzles

e) Diesel Fire Alarms

f) All heat sensors with the exception of the sensor in the 138 KV relay house which isn't installed yet.

Fire Hydrants 31, 32, 33, 35 and 36.

The remaining hydrants will be tested upon completion of southern fire main which runs by the turbine hall. This will be completed by criticality.

Basis - Fire protection has been completed sufficiently to provide adequate protection for the unit. The remaining sections to be completed involve fire hydrants located outdoors along the southern portions of buildings. These areas are presently protected by using additional hoses from existing hydrants.

4.5.6 SI Instrumentation

Test is 40% complete. Testing of the accumulator level instrumentation is in progress and will be completed prior to RCS

heatup. Spray additive tank level instrumentation will be done when spray additive tank is filled prior to RCS heatup.

Basis - The accumulators and spray system are maintained isolated while the RCS is in cold shutdown and are not required until the RCS is heated up.

4.11.1 Heating Ventilation and Cooling

The portions of the system that have been identified as being required for core loading have been completed. These portions are as follows:

a) Control Room

b) Diesel Building

c) Containment Pressure Relief

d) Control Building

e) Electrical Tunnel

NOTE: Refer to G.2.a for additional information on the status of ventilation system testing.

Basis - The remaining portions of the test are associated with equipment which is not required operable or tested per the FSAR and Technical Specification prior to key events after core load. (i.e., heatup above cold shutdown, initial criticality).

4.13.5 Boric Acid Heat Tracing

Portions of the system have been identified as being required for core loading. Testing of these systems is 97% completed and will be 100% complete prior to core load. The remainder of the system will be completed prior to initial criticality.

Basis - The circuits required for core load provide heat tracing for highly concentrated boric acid injection lines into the RCS. The remaining circuits are associated with the waste disposal and boron recycle systems which are not required until after initial criticality.

A.2 Integrated Leak Rate Test Report Acceptance

No response required.

A.3 Reactor Internals Vibration Analysis Report

The results of Westinghouse inspection, measurements and correlation of prototype reactor internals vibration test results to Unit 3 have been evaluated and reported by Westinghouse and reviewed and accepted by Con Edison. This report is attached.

B. Operations

B.1 Safety Related Procedures

(a) System Operating Procedures

1. SOP-WDS-1 Liquid Waste Disposal System Operation
2. SOP-WDS-6 Liquid Waste Discharge Procedure
3. SOP-WDS-7 Gaseous Waste Discharge Procedure

Preliminary drafts of these procedures have been written. However, final approval of these procedures is contingent upon issuance of the Environmental Technical Specifications. Final approval is expected to be completed prior to RCS heatup.

Basis - Radioactive waste discharges will not be required until initial criticality.

(b) Surveillance and Calibration Procedures

The following procedures have been approved:

3-PTM-22 Diesel Generators

3-PTQ-2 Process Radiation Monitor

3-PTV-7A BFP Turbine Mechanical Overspeed

The proposed Unit No. 3 leak test procedure 3PTV-3 is basically the same as the Unit No. 2 Surveillance procedure. However the newly proposed heatup pressure/temperature curve in the Technical Specification will require the hydrostatic test to be performed with the reactor coolant system at elevated temperatures. Final procedure approval is pending resolution of the Technical Specification hydrostatic test curve and will be approved prior to initial criticality.

C. Quality Assurance for Operation

Completed.

D. Emergency Plan and Implementation

Completed.

E. Security Plan and Implementation

The security plan for core loading has been implemented. Approximately 10% of the alarms and approximately 8% of the locks are yet to be installed in areas which are not essential

to core loading. These alarms and locks will be completed prior to initial criticality. Details of the security plan and its current implementation were discussed with the NRC: IE inspector on November 6-7, 1975. The fence clearance question has been corrected.

F. Independent Measurements

Complete

G. Waste Disposal Systems and In Plant Radiation Protection

1. Calibration of Waste Monitors

Complete

2. Preoperational Tests

(a) Ventilation Systems (CR, FSB, Containment)

1) Construction and testing of the Control Room Ventilation System is complete.

2) Construction of the containment ventilation system is complete and tne following testing has been corpleted:

a) Safeguards logic testing of the fans and dampers

b) Final adjustmenets and flow balancing of the containment ventilation

Remaining testing of the containment ventilation system will be completed prior to RCS heatup in accordance with FSAR Table 13.1-1 item 37.

Basis - All testing to ensure proper circulation of air within the containment building during and after core loading has been completed. Fans have previously demonstrated their operability during the containment air test and during hot functional testing of the RCS.

3) Construction of the Fuel Storage Building ventilation system is complete. Testing of the fuel storage building ventilation will be completed prior to handling irradiated fuel.

Basis - The fuel storage building emergency ventilation system is required to be operable whenever irradiated fuel is in the building. Presently new fuel is stored in the building and will be removed following core loading. The system will be demonstrated to be operable prior to initial criticality.

(b) PAB Filter System:

This system has been redesigned and modified to provide for continuous radioiodine removal. Construction is complete except for loading filter media. Preoperational tests of this system will be completed and the system put into service prior to initial criticality. Operations prior to criticality will not result in radioactivity in the PAB.

(c) HEPA and Charcoal Test (FSB, Containment and CR Fans)

These tests are complete and the results have been reviewed and found acceptable with the following exception. The test of the control

room HEPA filter is incomplete and will be completed prior to initial criticality. The control room will not be subject to accidental readiactivity prior to initial criticality.

The proposed Unit 3 technical specifications require freon and DOP filter tests within ± 20% of design accident flow. For the fuel building and containment charcoal filters initial preoperational tests were conducted at 75% of design accident flow. We have reviewed these results and found them to be acceptable for preoperational testing. Further required periodic tests will be run within the ± 20% of design accident flow.

For the fuel building HEPA filter, the inital preoperational test was run considerably above 1.20 times design accident flow. Evaluation of this test has not been completed; however, it will be completed and reviewed with the NRC inspector prior to initial criticality. The fuel building emergency ventilation system is required to be operable whenever irradiated fuel is stored in the building, which event will not occur until much later after initial criticality.

]

(d) Liquid Waste System

System construction is complete. System testing is complete except for testing of the waste evaporator and Reactor Coolant Drain Tank Pumps. Preliminary testing of the reactor coolant drain tank pumps has already been done. Final testing will be completed prior to intial criticality.

Basis - Radioactive waste will not be generated, thereby not required to be processed until initial criticality. The liquid waste system has been demonstrated to be capable of transferring water.

(e) Gaseous Waste

System testing is approximately 50% complete and will be totally complete prior to initial criticality.

Basis - Gaseous waste will not be generated, thereby not required to be processed until initial criticality.

3. Stack Sampling System

This system is complete, however, following inspection by NRC: IE inspectors, we have redesigned the tubing supplying stack samples to minimize short radius bends. The revised design has been reviewed and accepted by the NRC: IE inspector. The redesigned tubing will be installed prior to initial criticality. It is not required prior to that time because no radioactive material will be generated.

H Construction

Construction and testing of Indian Point Unit 3 are complete in preparation for license authorizing power operation and fuel loading with minor exceptions. The significant exceptions are listed below and have been discussed with the representative from the Office of Inspection and Enforcement.

1. Steam Generator Corrections

See response to Item 2 of Enclosure 2.

2. Fire Stops on Electrical Cables and Penetrations:

Fire stops on electrical safety related cables will be completed at floor and wall penetrations prior to initial core loading. This completed work will be available for NRC: IE inspection by November 13, 1975.

3. Instrument Air Checks

Construction of the system is essentially completed. Mechanical testing of the system has been completed. Electrical system testing is expected to be completed prior to reactor coolant system heatup.

Basis - FSAR commitment (see Response to Question 9.36).

System installation and testing, however, is sufficiently complete to allow manual operation of the by-pass system.

4. Seismic Restraints

All seismic restraints are in place. Correction of punchlist items and final inspection of the hydraulic restraints will be completed by heatup. These restraints are not required to be functional prior to the thermal expansions associated with heatup after fuel loading.

5. Containment Sample Line Penetration

Preliminary redesign has been completed of the sample line penetration to improve its reliability. Modification in accordance with the revised design will be completed during the first convenient outage following power operation but no later than first refueling. Until the modification is completed, administrative controls will be instituted to insure that the sample lines are kept at temperatures such that the ΔT between any two sample line is less than the maximum design ΔT design limit of 100°F. Even if a failure were to occur, the lines are of such small size that the capacity of the charging system is more than adequate to compensate for the potential leakage.

6. Pre-service Inspection Documentation

Pre-service Inspection has been completed on Unit No. 3. Pre-service inspection documentation has been reviewed by Con Eison and will be available for NRC: IE review by November 12, 1975.

INDIAN POINT UNIT NO. 3

REPORT - REACTOR INTERNALS TEST PROGRAM

INTRODUCTION:

The IP-3 reactor internals have been subjected to a pre-operational functional test program to demonstrate that flow-induced vibrations similar in nature to those expected during operation will not cause damage.[1] [4] This report summarizes the results of the IP-3 Reactor Internals Test Program.

DISCUSSION:

For purposes of determining the functional test program, the IP-3 reactor internals are considered as similar in design to that of the vibration-tested prototype internals.[2] This classification is based on the IP-3 reactor internals configuration having substantially the same arrangement, design, size, and operating conditions as the 4-loop prototype reactor internals. The IP-3 functional test program has provided system flow conditions, as well as a predetermined inspection program (both similar to the prototype program), assuring that vibration assessments were in accordance with this classification.

Westinghouse Topical Report WCAP-7979[2] (with subsequent AEC approval December 8, 1972) supports the use of the IP-2 reactor internals as the 4-loop prototype design for IP-3.[3] As the IP-3 reactor internals are substantially identical to the prototype internals, no modifications to the vibration analysis, anticipated structural and hydraulic response, and test acceptance criteria are necessary to account for any minor differences that may exist between the IP-3 internals and the IP-2 prototype internals.

During the hot functional test, the internals were subjected to a total operating time at greater than normal full flow conditions (four pumps operating) for a cumulative period of approximately 256 hours. This 4-pump operation consisted of approximately 74 hours at less than 430°F, approximately 62 hours between 450°F and 540°F, and approximately 120 hours at 540°F, totaling 256 hours and 5 minutes. This running time at temperature

for IP-3 was evaluated by W-FNH Engineering as exceeding the full flow requirements for hot functional testing. The 350 hour, 5 minute running time provided a cyclic loading of approximately 10^7 cycles on the main structural elements of the IP-3 internals. In addition, there was some operating time with only one, two and three pumps operating at various temperature levels. The IP-3 functional test conditions were essentially the same as the prototype; the test duration was longer than that of the prototype design. Because the stress levels on the main structural components are well below the design allowable stress for high cycle fatigue, and because this careful inspection has shown no evidence of damage or unacceptable defects due to vibration, the IP-3 internals were free from harmful vibrations and performed their functions as intended.

Following completion of the IP-3 preoperational functional tests, the reactor internals were examined in accordance with a specified inspection program. Included in this comprehensive visual and dye penetrant inspection program prior to and following hot functional testing are the following areas of interest considered indicative of the overall performance of the core support structure (particular attention is given to the interface of connection between two or more parts which would most probably indicate evidence of the motion of a component or relative motion between components, and those components most likely to indicate a structural change):

1. All major load bearing elements of the reactor internals relied upon to retain the core structure in place.

2. The lateral, vertical, and torsional restraints provided within the vessel.

3. Those locking and bolting devices whose failure could adversely affect the structural integrity of the internals.

4. Other locations on the reactor internal components which were examined on the prototype design. (Note: The inspection program for the IP-3 reactor internals[6] is identical to that used on the prototype internals.[2])

5. Inside of the reactor vessel with the internals removed, to verify that no loose structural members were in evidence.

The locations of the items or areas on the upper internals, lower internals, and reactor vessel given a particularly close inspection are shown on Reference 6. Inspection procedures and acceptance standards notes thereon are the same as required in the shop by the original design drawing and specification. The results of the inspections, as performed by a qualified Westinghouse Quality Assurance Inspector, are included on Reference 6.

RESULTS:

The results of the IP-3 inspection after the pre-operational hot functional flow test showed acceptable results for all of the above considerations. Slight wear to the degree expected for the operation was observed on a few bearing surfaces, due to normal operation and installation and removal of the core barrel. The comments and observations of the W QA Inspector shown on Reference 6 indicate that the areas examined either showed "no change" or acceptable differences from the condition that existed prior to the hot functional testing. As no dissimilarity of responses was observed between the IP-3 tested internals and the prototype internals, no further evaluation or corrective action is necessary to confirm acceptance of the IP-3 test results and reactor internals.

CONCLUSIONS:

Based on the successful completion of the IP-3 pre-operational hot functional testing, inspection of the IP-3 reactor internals in accordance with the predetermined inspection program, and satisfactory evaluation of the results of the program, the IP-3 reactor internals are declared qualified for plant operation.

The testing and inspection of the IP-3 reactor internals is in agreement with the intent of Safety Guide 20[1] [5] for reactor internals similar to the prototype design.

REFERENCES:

1. IP-3 FSAR Volume 6, Response to Question 3.14.

2. WCAP-7879; "Four Loop PWR Internals Assurance and Test Program"; July, 1972, Westinghouse Proprietary Class 2.

3. IP-3 FSAR Volume 6, Response to Question 3.13.

4. IP-3 FSAR Volume 4, Table 13.1-1.

5. Safety Guide 20 - "Vibration Measurements on Reactor Internals"; dated December 29, 1971.

6. Vibration Checkout Functional Test Inspection Data (IWT); W Drawing 686J470, Sub.3.

Enclosure 2

Item 9 Technical Specifications

No response required.

Item 10 Class IE Electrical Equipment Qualification Program

(a) When the results of the verification program to certify the adequacy of the Class IE electrical equipment within the Westinghouse scope of supply are available, they will be reviewed and corrective actions as necessary will be taken.

(b) The equipment in the Westinghouse scope of supply which utilize the referenced WCAP topical reports as the bases for their qualification is as listed in item 10 (b) of your letter except for the following additions:

i. Environmental (inside containment) - Indian Point 3
   5. Internal Recirculation Pump Motors (WCAP-7829)

ii. Seismic - Indian Point 3
   8. Bypass Loop Reactor Coolant RTD's (WCAP-8234)

Although WCAP-8234 is not now referenced in the IP-3 FSAR or Docket File, the next FSAR Supplement will include an appropriate reference to this report as a basis for the IP-3 bypass loop reactor coolant RTD's sesimic qualifications.