RO:I Form 12
(Oct 74) (Rev)

U.S. ATOMIC ENERGY COMMISSION

DIRECTORATE OF REGULATORY OPERATIONS

REGION I

RO Inspection Report No: 50-286/74-26 Docket No: 50-286

Licensee: Consolidated Edison Company of New York, Inc. License No: CPPR-62

4 Irving Place Priority:

New York, New York 10003 Category: B1

Location: Indian Point 3, Buchanan, New York Safeguards Group:

Type of Licensee: PWR, 965 MWe (Westinghouse)

Type of Inspection: Routine, Announced

Dates of Inspection: December 16-20, 1974

Dates of Previous Inspection: November 18-22, 1974

Reporting Inspector: E C McCabe Jr Sen 1/15/75
T. Martin, Reactor Inspector Date

Accompanying Inspectors: T Rebelowski 1/15/75
T. Rebelowski, Reactor Inspector Date

A. Fasano 1/15/75
A. Fasano, Reactor Inspector Date

Date

Date

Other Accompanying Personnel: Date

Reviewed By: E C McCabe, Jr 1/15/75
E. C. McCabe, Senior Reactor Inspector Date
Nuclear Support Section, Reactor Operations Branch

SUMMARY OF FINDINGS

Enforcement Action

None

Licensee Action on Previously Identified Enforcement Items

Not Inspected

Design Changes

None Identified

Unusual Occurrences

None Identified

Other Significant Findings

A. Current Findings

1. The "Vapor Containment Structural Integrity Test and Leakage Rate Test" procedure was reviewed.

2. Type "B" and "C" leak rate testing procedures were reviewed.

B. Status of Previously Reported Unresolved Items

Not Inspected

Management Interview

At the conclusion of the inspection on December 20, 1974, a management interview was conducted with the following personnel:

G. Coulbourn, Construction Manager, Con. Edison
T. Erion, Test Program Director, WEDCO
W. Josiger, Test Engineer, Con. Edison
V. Perry, Superintendent, Field Operations, Con. Edison
S. Zulla, Operating Engineer, Indian Point 3

The following summarizes the items discussed:

A. A need for a temperature survey to justify test instrument locations. (Details, Paragraph 2.a)

B. The licensee's commitment to safety measures for access to the pressurized containment. (Details, Paragraph 2.e)

C. The inspector's request for a revision to the test pressure criteria. (Details, Paragraph 2.g)

D. The inspector's request for a revision to the Integrated Leak Rate Test (ILRT) Stabilization Period specification. (Details, Paragraph 2.h)

E. The requirement for periodic full pressure tests of the entire personnel airlock. (Details, Paragraph 3.h)

F. The requirement to include instrument error in comparing test data with the acceptance criteria. (Details, Paragraph 2.k)

G. The requirement to correct the ILRT results for test connection penetration leakages that do not match DBA conditions. (Details, Paragraph 2.l)

H. The need to completely specify definitions for variables that are calculated from the test results. (Details, Paragraph 2.m)

I. The inspector's need to review an approved copy of the procedure to close the majority of open or unresolved items. (Details, Paragraph 2.n)

J. The inspector's request that the list of isolation valves be reviewed to ensure all those requiring type "C" testing have been included. (Details, Paragraphs 3.e and 3.f)

K. How and why water leakage test data is used for type "C" testing. (Details, Paragraph 3.b)

L. The inspector's concern with the influent flow test rig accuracy. (Details, Paragraph 3.g)

M. The deviation of the procedure specification on test pressure plateaus from Regulatory Guide 1.18, Revision 1. (Details, Paragraph 4.a)

N. The need to record outside temperatures prior to the Structural Integrity Test (SIT). (Details, Paragraph 4.d)

O. The inspector's request for additional information concerning structure interference. (Details, Paragraph 4.g)

P. The licensee's commitment to include a penetrations list, showing spare and plugged locations, in the SIT procedure. (Details, Paragraph 4.i)

Q. The licensee's commitment to ensure a Structural Design Consultant is available to the Test Director around the clock during the test. (Details, Paragraph 4.j)

R. The licensee's commitment to retake structural data on unexpected pressure losses that drop below previous pressure plateaus. (Details, Paragraph 4.n)

S. The licensee's confirmation of a warped equipment hatch. (Details, Paragraph 4.o)

DETAILS

1. Persons Contacted

S. Cantone, Chief Engineer, Indian Point 3
G. Coulbourn, Construction Manager, Con. Edison
T. L. Erion, Test Program Director, WEDCO
W. A. Josiger, Test Engineer, Con. Edison
K. O'Connor, Associate Engineer, Con. Edison
V. Perry, Superintendent, Field Operations, Con. Edison
E. A. Reeves, Operations/Procedures Manager, WEDCO
S. Zulla, Operations Engineer, Indian Point 3

2. Integrated Leakage Rate Test

The inspector reviewed a draft of the "Vapor Containment Structural Integrity Test and Leakage Rate Test", INT-TP-4.11.9, against the requirements of 10 CFR 50, Appendix J. The following areas of concern address the Integrated Leak Rate Test (ILRT) sections of the procedure.

a. Temperature Survey

The inspector questioned whether a temperature survey, meeting the requirements of American National Standard, N45.4-1972, Section 7.4, had been performed; or, whether the licensee could identify a prototype containment temperature survey as justification for the location of his temperature sensors.

The licensee stated a temperature survey would be conducted and this item remains open awaiting verification.

b. Gas Cylinder Removal

The inspector requested a procedure change that would document the removal from the containment of all gas cylinders.

The licensee stated this would be done. This item remains open awaiting confirmation of its inclusion in the approved procedure.

c. Pressure Sources

The inspector stated that, during the Integrated Leak Rate Test, an inspector will verify that pressure sources external to the containment are prevented from leaking into the containment.

The licensee acknowledged the statement and this item is open.

d. External System Control

The inspector questioned how the licensee planned to prevent the insertion of artificial leakage barriers in the lines extending from the containment, when a sampling of the valve line-ups showed that, in some instances, it appeared the lines were neither vented or checked in a normal lineup.

The licensee responded that it was his intent to vent or control external systems in a DBA condition, and the valve line-ups would be reviewed against this criteria and revisions made as necessary.

The inspector stated the implementation of this criteria would be verified during the Integrated Leak Rate Test (ILRT) and this item remains open awaiting the conduct of the test.

e. Pressurized Containment Entry

The inspector noted that the licensee's procedures require containment entry at 12 psig. The inspector questioned what procedures were being used to meet the intent of American National Standard N45.5-1972, Section 7.5.

The licensee stated he would meet OSHA requirements, and the inspector had no further questions in this area. This item is closed.

f. Instrument Calibration

The inspector stated that the temperature, pressure, and humidity instrument calibrations would be compared against N45.4-1972, Section 6, during the ILRT inspection. The inspector questioned where these instruments would be located.

The licensee stated that the calibration documentation and the instrument location specification, would be available for the inspectors review during the test. These items are open.

g. Test Pressure

The inspector questioned what was the tolerance on test pressure and what instrument would control. The inspector requested a commitment that, at the start of the ILRT, the lowest pressure instrument shall read at least Pt or Pa, depending on which test is being run.

The licensee stated that the procedure would require the lowest pressure instrument to read at least test pressure at the start of the ILRT. This item is open awaiting review of the approved test procedure.

h. Stabilization Period

The inspector requested a commitment to the following criteria for successful completion of the stabilization period:

(1) At least four hours have been allowed for stabilization,

(2) Average pressure trend is following average temperature trend,

(3) The rate of change of average temperature over the last 2 hours is less than or equal to 1^{o} F/hr,

(4) The leakage rate over the last hour as computed by the point to point method is positive or zero.

The licensee stated the inspector's comments had been incorporated in the procedure. This item is open awaiting a review of the approved procedure.

i. Instrument Failures

The inspector requested that the instrument failure criteria of the "Construction Check List for Vapor Containment Air Test", Section 4.0, be included in the body of the ILRT test procedure.

The licensee stated an instrument failure criteria would be included in the procedure. This item remains open pending examination of the instrument failure criteria in the approved procedure.

j. Peak Pressure ILRT Acceptance Criteria

The inspector stated that the acceptance criteria outlined in Section 6.16.7 of the licensee's Preliminary ILRT procedure does not conform to 10 CFR 50, Appendix J. Specifically:

	INT-TP-4.11.9	APPENDIX J
(1)	Lam $\leq$ 0.75 La	Lam < 0.75 La
(2)	/Lam $\pm$ Lam/$\leq$ 0.25 La	/Lam - Lam/$\leq$ 0.25 La
(3)		Lam $\leq$ Ld

The licensee stated the procedure has been revised to correct items (1) and (2). The licensee stated La and Ld are the same on Indian Point 3; and therefore acceptance criteria (3) is replaced by criteria (1). This item is open awaiting review of the approved procedure.

k. Instrument Error

The inspector stated that 10 CFR 50, Appendix J, Section III. A.3.(c), requires that leakage rates include instrument error when determining if acceptance criteria have been met.

This item remains unresolved.

l. Correction to ILRT Results

The inspector stated that, following the test, type "B" and "C" testing must be done on penetrations 864, 865, 866, 867, and 868 shown on drawing 9321-F-2778B; and the results added to the type "A" test results. This requirement is the result of the licensee's use of these penetrations during the "A" test for temporary connections that would not be in place during the DBA.

The licensee stated that type "B" and "C" testing indicated above would be done, but that only half of the resulting leakage should be added.

This item is unresolved.

m. Formulas

The inspector stated that the Percent Leakage formula in enclosure 3.2 to the procedure was missing a multiplication factor of 24/h. The inspector stated that the procedure was incomplete; since it required the individual executing the procedure to compute four variables; Ltm, Lpo, Lam and Lao; without indicating how this was to be done.

The licensee stated that the missing multiplication factor of 24/h was picked up in his review. This item remains open awaiting verification of its inclusion in the approved procedure.

Failure to include the formulas for the remaining variables remains unresolved awaiting further licensee information.

n. Approved Procedures

The inspector informed the licensee that the majority of the inspection items would have to be carried as open or unresolved until an approved procedure could be reviewed.

3. Local Leakage Rate Testing

a. Scope of Inspection

The inspector reviewed the following documents against 10 CFR 50, Appendix J. to verify type "B" and "C" testing, which should be completed prior to the ILRT, were being performed properly.

(1) "Containment Isolation Valve Leakage" Test Procedure, INT-TP-4.11.10.

(2) "Isolation Valve Seal Water System" Test Procedure, INT-TP-4.11.5.

(3) "Containment Penetration and Weld Channel Pressurization System" Test Procedure, INT-TP-4.11.8.

(4) Proposed revision to Technical Specification Table 4.4-1.

(5) Proposed supplement to Final Safety Analysis Report, Figures 5.2-1 thru 5.2-27.

(6) Various piping drawings.

The inspector had no further questions on these documents, except as indicated elsewhere in this report.

b. Water Leakage Testing

The inspector questioned why certain isolation valves were tested for leakage with water; and how water leakage test data was converted to equivalent containment DBA atmosphere leakage, before summing with other "B" and "C" test results.

This item remains unresolved.

c. N_2 Injection Header Leak Check

The inspector requested a revision to test procedure INT-TP-4.11.5 to prevent nitrogen pressure in two charged N_2 bottles and the Seal Water Tank, from leaking into the test volume of the N_2 Injection Header, and thereby masking volume leakage.

The licensee stated the procedure would be revised. This item remains open awaiting review of the revision.

d. Service Water Isolation Valve Leakage Test

The inspector questioned by what procedure Ventilation Cooling Water Isolation Valves are tested.

This item remains unresolved.

e. Test Connection Isolation Valves

The inspector questioned why penetration line test connection isolation valves were not scheduled for type "C" testing. Specifically, test connection isolation valves that serve as a containment boundary and can not be separated from the containment by an automatic isolation valve require this test, even if they are capped.

In a subsequent telephone conversation, the inspector stated this criteria also applied to vent and drain valves on isolation lines.

This item is unresolved.

f. Penetration and Weld Channel Pressurization Isolation Valves

The inspector questioned why the Penetration and Weld Channel Pressurization System containment isolation valves were not subject to type "C" tests.

The inspector stated that these valves could be exempted from testing, if the licensee could demonstrate that the Weld Channels were welded to the applicable ASME code.

This item remains unresolved.

g. Local Leakage Rate Test Rigs

The inspector expressed concern with the design and use of the influent and effluent flow test rigs. Specifically, no provisions are made for preventing bypass flow around the rig flow meters.

The licensee proposed a periodic certification of the leak-tightness of the bypass valves on the influent flow test rig. The licensee felt that the effluent flow rig was satisfactory, since any bypass flow would have to negotiate two shut valves with only the flow meter pressure drop for a driving head.

This item remains open awaiting establishment of the frequency and certification method of the influent flow test rig in an approved procedure.

h. Air Lock Testing

The inspector questioned whether a full pressure test of each entire air lock had been performed. The inspector stated that a full pressure test of the entire air lock should be conducted at 6 month intervals, with air lock double gasket seals tested after each opening when containment integrity is required. The inspector noted that Indian Point 3 air lock seals are tested automatically after each opening.

The licensee did not commit to testing the entire air lock at full pressure at least every 6 months and this item remains unresolved.

4. Structural Integrity Test

The inspector reviewed a draft of the "Vapor Containment Structural Integrity Test and Leakage Rate Test", INT-TP-4.11.9 against Regulatory Guide 1.18, Revision 1, and the Final Safety Analysis Report. The following areas of concern address the Structural Integrity Test (SIT) sections of the procedure.

a. Pressure Increments

The inspector stated that the reviewed procedure did not meet Regulatory Guide (RG) 1.18, Structural Acceptance Test for Concrete Primary Reactor Containments, paragraph C.1, which states in part, "...an acceptance test that increases the containment's internal pressure in four or more approximately equal pressure increments ...(and)... depressurized in the same number of increments". The licensee's pressure plateaus are 0, 12, 21, 41, 54, 41, 18, 21, 41, 0 psig. The inspector questioned why plateaus at approximately 30 psig increasing and decreasing, and 12 psig decreasing had been omitted.

The licensee stated that their engineers believed the intent of RG 1.18 had been met, but that a decreasing plateau of 12 psig would be added. This item remains open awaiting inclusion of the 12 psig plateau in the approved procedure.

b. Organizational Chart for Conduct of Test

The inspector stated that the licensee has not addressed the specific duties, functions, or authority of individuals noted in Appendix 3.9 of the checklist.

The licensee stated that Appendix 3.9 would be modified to clearly reflect the test organization and lines of responsibility. The licensee committed to having a structural consultant on site and available to the test coordinator for the duration of the test. Pending review by the inspector of the revised checklist appendix, these items remain open.

c. Data Sheets

The inspector stated that the procedure did not include data sheets that would be used to record selected area crack patterns.

The licensee presented the inspector with data sheets that would be used during the test and that would be included in the Final Report of the Containment Vessel Structural Integrity Test.

The inspector stated that the use of the data forms would be reviewed during the performance of the test. This item is open.

d. Temperature Measurements

The inspector stated that the test procedure includes the stabilization of containment interior temperature prior to the test. The requirement for recording exterior temperature, for a predetermined period prior to the test, is not addressed.

The licensee agreed to record exterior temperatures prior to the test at 6 hour intervals for at least 24 hours. This item remains open awaiting approved procedure review.

e. Access Control

The inspector stated that the procedure did not address the method of limiting access to secondary and containment areas, prior to and during the progress of test.

The licensee stated that the WEDCO safety department would address this issue. Pending the inspector's review of controls during performance of the test, this item remains open.

f. Areas of Survey

The inspector stated that the procedure in paragraph 6.1.8 denotes the method of preparing areas for crack surveillance. The inspector requested information concerning selection of the monitored areas.

The licensee stated that five areas have been selected by analysis of the containment structure and from experience gained on the Unit 2 S.I.T. Additional areas will be designated upon completion of the exterior survey of the containment. Those areas exhibiting the largest cracking patterns will be monitored.

This item is closed.

g. Interference Areas

The inspector requested additional information on the detailed investigation of containment structure to adjoining structure interference. The procedure does not provide details of the probable interferences monitored.

The licensee stated an interference inspection procedure did exist and would be available to the inspector for his review during the test.

Pending review of the approved procedure, this item is open.

h. Method of Determining Crack Widths

The inspector questioned the use of feeler gauges to determine crack width.

The licensee stated that optical comparators would be used in place of feelers. A method to check their calibration will be available on site.

This item will be reviewed during the progress of the SIT. This item is open.

i. Listing of Penetrations

The inspector stated that the check off sheet should contain a listing of all penetrations. Unused spares, and piping penetrations that are partially used, must be identified in the checklist to the survey team. This item was not addressed in the SIT procedure.

The licensee stated that a listing would be available to the survey team. Pending review of the checklist, this item remains open.

j. Crack Criteria

The inspector stated that the procedure did not address the criteria for maximum allowable cracking. Precautionary notes were not included that would require termination of pressurization under conditions that would require reevaluation of test results by the Test Director.

The licensee stated that a Structural Design Consultant would be available to the Test Director on an around the clock basis during the test. Survey data will be submitted to the Test Director for his approval before proceeding to the next pressure level.

The inspector has no further questions in this area. This item is closed.

k. Invar Wires

The inspector requested information on the number and location of the Vapor Containment Structure deflection monitoring Invar Wire Extensometers. The inspector stated that these specifications would be compared to the actual installation during a subsequent inspection.

The inspector stated that an acceptable specification would be a duplication of the number and location of deflection monitoring devices used on Indian Point 2.

This item remains open awaiting review of the licensee's specification and installation of deflection monitoring devices.

l. Test Pressure

The inspector requested that the procedure be revised to require that pressure be raised to at least 54 psig, as measured by the lowest reading precision pressure instrument, PI-1 or PI-2, during the SIT at 1.15 Pd. The inspector stated this change would be consistent with RG 1.18, Section C.1.

The licensee stated the procedure now requires that pressure be raised to at least 54 psig, as measured by the lowest reading precision pressure instrument. This item is open awaiting verification that the commitment has been implemented.

m. Unexpected Pressure Drops

The inspector requested a commitment to repeat the test sequence for each test pressure plateau if an unexpected pressure loss was incurred.

The licensee stated that structural data would be recorded at each pressure plateau on an unexpected pressure loss; but that such structural data would not include a crack survey.

This item is closed.

n. Warped Equipment Hatch Flange

The inspector questioned whether the equipment hatch flange was warped.

The licensee stated that the flange was slightly warped and that a proposed remedy was being evaluated.

This item remains open.